THE UNIVERSITY OF ALBERTA

A STUDY OF ACADEMIC UNDERACHIEVEMENT AMONG EDUCATION STUDENTS AT THE UNIVERSITY OF ALBERTA

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A B S T R A C T

A study of academic underachievement among Education students at the University of Alberta was made during the 1959-1960 school year. The research sample consisted of those students who had been enrolled as first-year students during the previous year, whose records showed both scholastic aptitude scores and grade averages, and who were again enrolled in the Faculty of Education and available for testing during the current year. Those whose standard score for grade average deviated .5 or more from their standard score for scholastic aptitude were identified as overachievers or underachievers.

The main purpose of the study was to trace the personality and study factors which were related to underachievement and to measure the extent of their significance. For the assessment of personality factors the Edwards Personal Preference Schedule was used, and for the assessment of study factors the Brown-Holtzman Survey of Study Habits and Attitudes was used. These tests were administered to the entire research sample--underachievers, overachievers, and the normal group. Statistical analysis of the resulting data was then made by computing the significance of the differences between the underachievers' and overachievers' means for the personality and study variables, and by calculating both zero-order and partial correlations among the various variables, grade

averages, and aptitude scores.

The results of the investigation showed the underachievers to be significantly characterized and differentiated by the manifest needs for Dominance and Affiliation, and to some extent by the need for Change. Overachievers, on the other hand, were found to be characterized strongly by the need for Achievement and to some extent by the needs for Order and Endurance.

The comparison of the difference-between-means data with the correlations data indicated that underachievers and overachievers comprise a pair of categories which are quite different from those of low achievers and high achievers. Furthermore, partialing out the influence of the scholastic aptitude scores revealed significant implications of the ability factor.

During the course of the study the need for further research along two lines became apparent. In the first place, it seems that "reverse" studies should be made, where individuals possessing certain personality patterns would first be identified and then submitted to achievement tasks in experimental fashion. In the second place, it appears that further investigation of the areas of adjustment and motivation would be helpful.

A C K N O W L E D G E M E N T

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CHAPTER I

BACKGROUND OF THE STUDY

The modern world is characterized by an ever increasing demand for brains rather than brawn. Military defense calls for men who are familiar with the latest developments of science and engineering. Industry depends upon a host of employees who understand laboratory techniques, the principles of mechanization, and the dynamics of mass production. Business requires a knowledge of the intricacies of corporate finance and of the psychology of merchandising. Even agriculture has become such a highly skilled endeavor that the successful farmer must be able to employ scientific methods, maintain and operate intricate machinery, and deal in complicated business transactions. Likewise in practically every other field of human endeavor--the professions, public service, home-making, labor, or leisure--full and effective living requires more and more "know-how". Such are the demands of the present technological and socialized age, and it is to the educational institutions, especially at the university level, that society looks for the necessary knowledge and training.

Although the American and Canadian schools have received widespread criticism for not meeting the educational needs of the day, it cannot be said that nothing has been

done. Millions of dollars have been spent to expand buildings, libraries, and laboratories. Extensive research and study have been carried on in an effort to improve the curriculum and instructional technique. Financial assistance has been made available to needy students, and enrollments have climbed rapidly during recent years. Much, undoubtedly, is yet to be accomplished along these lines, but enough has been done to make this a day of unprecedented educational opportunity.

The concern of this study is the problem of academic underachievement which persists in the face of the urgent need for better education on the one hand and the generous educational opportunities on the other hand. It is encouraging to see so many young men and women attracted to higher education, but there is disturbing evidence that many of them are not achieving results commensurate with their abilities. In connection with an investigation of underachievement at Yale University, Neugeboren made the following observation:

> College administrators have been increasingly confronted with students who, although they have intellectual ability to do college work, are unable for various reasons to function in the college setting. . . . It appears that many are bright enough to score well on the customary aptitude and achievement tests and were previously able to succeed in secondary school, yet in their day-to-day college work their functioning is impaired by such problems as concentration difficulties, a general lack of ability to be self-directed, inability to establish their own goals, and lack of motivation to achieve goals. (Neugeboren, 1958, p. 63).

The Extent of Underachievement. It is difficult to set forth exact figures for the extent of underachievement because it is so difficult to define and measure. Neither aptitude nor achievement can be assessed with precision, and there is no standard of deviation of achievement from aptitude which is accepted as marking the underachiever. But regardless of definition or method of measurement, the extent of underachievement emerges as sufficiently large to constitute a serious problem. Rust (1958), who was associated with Neugeboren in the Yale study, found that in most universities multiple correlations of only .60 or .70 could be expected between freshman grades and predictive batteries consisting of secondary school grades, achievement tests, and tests of intelligence or scholastic aptitude. Likewise Frederikson (1952) found that the American Council on Education Psychological Examination for College Freshmen, commonly known as ACE and used most generally as a measure of scholastic aptitude, correlated only .47 with first-year college grades. If a fair degree of accuracy is admitted for these measures of scholastic ability, then such low correlations can mean nothing other than extensive underachievement.

Matthews (1956), reporting for the National Conference of Canadian Universities, points out that about one-third of the high school students who enter the universities of Canada fail, for academic reasons of some kind, to graduate. Likewise Jackson (1957), writing concerning Canada's crisis in

higher education, estimates that little more than one-quarter, or perhaps one-third, of the talents of Canadian youth are being utilized. These estimates indicate that the Canadian universities are plagued with the problem of underachievement to about the same extent as the American schools.

The Peril of Underachievement. The failure of approximately one-third of our college and university students to realize their full academic potential is a matter of grave concern. According to Matthews (1956) it represents a vast waste of time and effort, of brains and money, and constitutes a disease of a major kind which afflicts thousands of our young men and women. And according to Jackson (1957) we are driven to the inescapable conclusion that we are extremely wasteful of our limited resources of human talent.

The loss resulting from underachievement can be considered from three angles--the individual, the school, and society. Baymur and Patterson (1960, p. 60) recognize two of these when they explain that "underachievement is both a problem to the individual, who may suffer from the sense of failure, and to society, which loses the full potential contributions of unestimated numbers of its members." Chabassol (1959) also speaks of the loss to the individual and to society, but he recognizes further that underachievement involves a waste of effort on the part of the schools. Thus if the individual is to be spared such failure and

curtailment of effective living, if the school is to avoid unprofitable expenditure of time and money, and if society is to realize the full potential of available human resources, educators must come to grips with the problem of academic underachievement. They must devise ways by which the underachiever can more readily be identified, learn more about his characteristic traits and patterns of behavior, and be able to trace the causes which might account for his underachievement. Finally, they must develop means and methods by which underachievement can be prevented or corrected as far as possible.

The Need for Study and Research. Considerable attention has been given to the problem of underachievement, but further investigation is in order. The fact that the problem persists to such an extent indicates that adequate solution has not been found. Also, the results of previous studies have been inconclusive and contradictory, probably because of poorly-defined variables, inconsistent bases of sampling, and unstandardized measurement. It is possible, too, that the very complexity of the variables involved tends to defy consistency of results. Rust's appraisal of underachievement research (1958, p. 46) is that "orientation in this field is particularly difficult because the literature presents a vast multiplicity of experimental variables, deals with all academic levels, and is characterized

by a wide variation in the adequacy of experimental design." In the light of such confusion, further patient and ponderous research is necessary.

Additional study of the underachievement problem is especially justified on the Canadian scene where little of such investigation has been made at the university level. Recent research has been reported by Chapman (1958) and Chabassol (1959), but these studies were made at the grade X level where one would expect to find personality and situational implications quite different from those prevailing at the university level. Other research such as that reported by Zurousky (1959), Fitzpatrick (1956), Martin (1950) and Nelson (1949) is concerned with the university level, but deals primarily with the problem of prediction and not so much with the problem of underachievement. The studies reported by Davidson (1950) and Woodhams (1958) are more directly concerned with the implications of underachievement at the university level, but they deal only with limited phases of the problem.

More study of the underachievement problem on the Canadian scene is warranted also by the unique situation presented by the selective nature of the Canadian universities and their matriculation policies. One would expect that the more intensive screening would provide a more homogenous university population with less underachievement, but such has not appeared to be the case. Be that as it

may, however, the findings of American research should be confirmed in the Canadian setting to see if they hold true under the tighter matriculation program.

Still another reason for further investigation of the problem of underachievement at the university level is the lack of research oriented particularly to guidance services. The prevailing tendency appears to have been a concentrated concern with prediction problems, but an inadequate emphasis upon the implications of underachievement with which the college counselor would be concerned. Feder and Kounin suggest this situation in their defense of a motivational approach:

> Whereas most correlational studies reveal only static relationships, the study of motivational components deals with causal relationships in behavior. Only a knowledge of causal relationships makes it possible to predict, and hence to direct and control, the behavior of an individual in a concrete situation. (1940, p. 273).

The problems of prediction and of underachievement, though related and sometimes considered as one and the same, are really concerned with different assumptions and different points of emphasis. In the problem of prediction, achievement is accepted as a given fact and effort is made to establish the validity of various predictors, whereas in the problem of underachievement, certain measures of aptitude or capacity are accepted as given facts and the task is to discover those factors which prevent commensurate achievement. It is the later approach which has been somewhat neglected and calls

for additional research.

The Focus and Purpose of the Present Study. In the light of the general problem of academic underachievement as described above and as found in a review of related literature, this study has proposed to investigate the underachievement that prevails among education students at the University of Alberta. Attention has been focused upon those students who were enrolled for the first year of education during 1958-59, whose records show School and College Ability Test (SCAT) scores and grade averages for that year, and who were available for further testing during the 1959-60 school year.

This study is further delimited to an investigation of personality factors and study habits and attitudes that might be significantly related to the underachievement of the students concerned. Other factors such as family and educational background, interests and ambitions, and situational implications would also be worthy of investigation, but the delimitation has been proposed for the sake of conciseness and specific attention.

It is hoped that the results of this investigation will yield a better understanding of the implications involved in academic underachievement and be of service to those who are engaged in guidance services, not only at the University of Alberta but also at other colleges and universities.

CHAPTER II

GENERAL RESEARCH RELATED TO THE STUDY

A survey of research literature reveals that considerable attention has been given to the problem of academic underachievement. The scope of investigation has been broad, and various approaches to the problem have been pursued. Terms have been defined in different ways, and a wide variety of sampling methods have been employed. Likewise, a large number of instruments have been used, and the findings of the research have been varied. The purpose of this chapter is to review the reports of this mass of research in an effort to determine what progress has been made and what facts have been established, and also to provide orientation for the present study.

UNDERACHIEVEMENT BEFORE COLLEGE

Junior High School Level. The problem of academic underachievement has been investigated at all levels of the educational ladder. Ford (1956), for example, made a study at the junior high school level with the aim of making more definitive such related factors as social class, home conditions, peer relations, aspiration levels, and academic inclination. He found statistically significant differences between underachievers and overachievers in six of thirty

data items: sex, membership of parents in parent-teacher organizations, attitudes toward school, occupational ambitions, perception of occupational ambitions held by parents, and punishment and scolding received for making poor marks. Appreciable differences were noted with respect to five other factors: marital status of parents, employment of mothers, student's concern about doing good school work, time spent daily on school studies at home, and types of persons named as models, ideals, or objects of admiration. Little or no significant differences were found in connection with such items as social class, occupation of father, education of mother, family size, or schooling expectations of the student.

Calhoun (1956) reports another study at the junior high school level. In an effort to determine the effects of counseling on underachievers, he found that most pupils of that age are not aware of the disparity between their ability and their achievement. Also, he discovered that parents tend to share the feelings of the pupils concerning their underachievement, both as to cause and as to solution. Accordingly, Calhoun stresses the importance of counseling as a means of giving the pupil and parents the necessary information and the appropriate interpretation concerning capacity and performance.

Senior High Level. Studies of underachievement at the grade X level have been reported recently by Chapman (1958)

and Chabassol (1959), who carried out their research in Alberta. Chapman found by comparing 112 underachievers with an equal number of achievers that there were significant differences between the groups. The underachievers had a previous pattern of failure with lower marks in grade IX and a possible failure between grades I and IX. They were more often older chronologically, members of the male sex, and victims of poor study habits. They spent more time in out-of-school hobbies, took fewer private lessons, came from a non-professional family, and had parents with inferior education. They felt they had stable personalities, but teacher raters disagreed with them in some aspects and described them as rather quiet, sensitive, slow to adapt to changes, and inclined to give up too easily. Chabassol found through his intensive case study of about thirty grade X male underachievers that they showed tendencies of having feelings of rejection, inability to put forth persistent and sustained effort, indecision and lack of foresight, and a general dislike for the school situation. He also observed that once a pupil became an underachiever, he tended to remain so.

An example of the study of academic underachievement on the upper high school level is provided by Gough (1953) who pooled the test items of various psychological instruments in order to discover possible clusters of personality traits associated with underachievement and high achievement. The results of his investigation yielded the following

syndromes characteristic of the more successful students:

1. Optimistic self-confidence, self-control, and capacity for sustained and diligent application.
2. Acceptance of conventions, rejection of the frivolous and diversionary; orderliness, planfulness, and basic seriousness of purpose.
3. Personal efficiency, vitality, and integration.
4. Acceptance of others, denial of ill-will and animosity, absence of interpersonal friction, emphasis on equanimity and rationality.
5. Sense of academic effectiveness, good study habits, and sense of accomplishment. (Gough, 1953, pp. 326-327).

In a similar study of achievement on the high school level, Hinkelman (1952) used personality tests which would yield scores for nine bi-polar points: nervous-composed, quiet-active, depressive-gay, cordial-cold, sympathetic-stern, subjective-objective, aggressive-submissive, critical-appreciative, and autonomous-impulsive. He found that objectivity, composure, and self-mastery have the strongest relation to achievement in selected subject-matter fields. Other traits such as appreciative, submissive, and active were found to be important but to a lesser degree.

MacCurdy (1956) investigated the problem of under-achievement on the high school level in an indirect manner by tracing the characteristics and backgrounds of a group of superior science students who had received honorable mention or were winners in the Science Talent Search of 1952 and 1953. As for personality, they exhibited leadership qualities, self-control, self-discipline, curiosity, rationality, persistence, and a lack of gregariousness. In attitudes and opinions, they were characterized by suspended judgment,

seeking truth from empirical evidence, and recognizing the interdependency of science and society. Their interests tended to be non-athletic, solitary, intellectual, mechanical, and scientific. Likewise, their activities were socially limited, scholarly, and related to reading and study. Most of them came from stable and cultured homes which enjoy economic advantages, leisure time, and democratic permissiveness.

The foregoing examples illustrate the general pattern of the research findings related to academic underachievement below the college level. Usually the aim has been to trace significant correlates, and the implications of home and family relations loom especially large. Some caution should be exercised in accepting the results of such studies because clear-cut distinction is not always made between underachievement and low achievement, or between overachievement and high achievement.

UNDERACHIEVEMENT ON THE COLLEGE LEVEL

Academic underachievement on the college level is approached from various angles, and different problem areas are investigated. Some studies have been concerned with the biographical correlates of underachievement and the prediction of academic success. Other studies have given more attention to psychometric analysis, personality profiles, study habits and attitudes, and the implications of motivation and adjustment. All of these studies, however, are

sufficiently related to make the recognition of them important to any investigation of academic underachievement.

Biographical Profiles. The search for biographical correlates that characterize underachievers and overachievers and distinguish one group from the other has been one of the most common approaches to the study of underachievement at the college or university level. Such an approach undoubtedly has its merits, for the clear recognition of the biographical profile of the underachiever as distinguished from that of the overachiever should be helpful to those endeavoring to help students reach maximum achievement.

Carter and McGinnis (1953) found contrasting profiles of low achievers and high achievers by analyzing the information found in entrance records. The one most apt to become a high achiever was a young woman nineteen years of age, having a record of no failures and an average above "B" in high school. She also would have had at least three units of high school mathematics and would have read at least five books and six periodicals during her senior year. She was one of those who entered college with a definite vocational choice. The one most likely to become a low achiever, on the other hand, was a young man twenty years of age, having an average of "C" or less in high school, only one or two courses in high school mathematics, and having read fewer than three books and five periodicals during the senior year. He was

one of those who entered college with no definite vocational choice.

McQuary (1954) made a study of students at the University of Wisconsin in an effort to focus the difference between the underachievers and the overachievers. Like Carter and McGinnis, he used the informational data available to college counselors and admissions officers and found that the underachievers were more likely to have had a less fortunate background evidenced by a smaller percentage of fathers engaged in professional or semi-professional occupations, a smaller percentage of mothers engaged in professional or semi-professional occupations before marriage, less formal education for the fathers and mothers, a greater percentage of deceased or foreign-born parents, and financial limitations that made self-support on the part of the student totally necessary. Many of the underachievers had received their worsthigh school marks in natural science and had listed the applied and social studies as their favorite courses. They also were more likely to have sought a college education because old friends were doing so, and most of them were uncertain about their vocational choice, whereas the high achievers were motivated by more specific academic and vocational goals.

Malloy (1954) made a similar effort to draw distinguishing biographical profiles by making a study of overachieving and underachieving freshman girls. His study was unique

however, in that he used a Life Experience Inventory that drew more from the immediate situation than from background. He found that the underachiever dated less than the average girl, had a best friend who also had poor marks, and did not consider good grades worth the effort. She was elected to few offices and felt less accepted and less adequate than her friends. She showed little persistence and was not inclined toward challenging goals. The overachiever, on the other hand, liked her school work and enjoyed having it evaluated. In contrast to the underachiever, her best friend was also an overachiever. She showed a slight tendency to non-conformity, felt more intelligent than the average, and regarded herself as a diligent worker. She had a high level of aspiration and demonstrated persistence in her endeavors.

Personality Profiles. Another common approach to the study of underachievement at the college or university level is to examine the various personality variables that may characterize underachievers or low achievers, the emphasis being more upon the personality factors than upon general biographical correlates. Coleman (1960), for example, used the Edwards Personal Preference Schedule, the Allport-Vernon-Lindzey Study of Values, and the Strong Vocational Interest Blank to identify such personality traits among underachievers and overachievers at the Oklahoma Baptist University. She found that high-achieving students scored significantly higher

than moderate-achieving students on the Occupational Level scale of the Strong Vocational Interest Blank, indicating a greater similarity of interests to managerial and professional persons. Likewise, the high-achieving students scored significantly higher on the Interest-Maturity scale but lower on the Change scale of the Edwards Personal Preferance Schedule, indicating more maturity and more stable interests and less need to change activities frequently.

Morgan's study of the personality factors related to underachievement (1952) is similar to that reported by Coleman and his findings were similar. In regard to interests, he did not find that high achievers differed significantly from underachievers on Occupational Level, as did Coleman, nor did they differ significantly in variety of well-developed interests as manifested in interest patterns on the Strong Vocational Interest Blank. They did differ significantly, however, in the types of interests indicated by the profile patterns. Significantly more achievers than nonachievers showed interests typical of persons in social service or welfare occupations, while more non-achievers than achievers manifested interests typical of persons in business detail occupations and business sales occupations. Thus Morgan's conclusion in regard to the relation of interests to achievement was similar to that of Coleman. Their findings were in agreement on the fact that high achievers score higher on the Interest Maturity scale. In regard to other personality

factors, Morgan found that high achievers rated high in Dominance, Responsibility, and Intellectual Efficiency on the Minnesota Multiphasic Personality Inventory, and also high in Need for Achievement according to the Thematic Apperception Test.

Field (1954) reports a study of personality correlates in which he found the high achievers to be marked by Conformity, Inquiring Intellect, Confident Self-Expression, and a tendency toward liberality revealed by the validity scale in the Minnesota Multiphasic Personality Inventory. The Conformity which Field found probably could be regarded as equivalent to the Deference which Coleman reported for high achievers. Field also investigated the personality factors of social adaptability, emotional control, and disturbance in identification as revealed by the Blacky measures, but he found no significant differences between the high achievers and the underachievers.

At the University of Alberta, Fair (1959) endeavored to trace the personality variables related to underachievement through the use of the California Personality Inventory. None of the eighteen scales, however, revealed differences sufficiently large to distinguish probationers from non-probationers. Significant but low correlations did appear, however, between Responsibility, Socialization, Achievement via Conformance, Flexibility, and Femininity on the one hand and grade averages on the other hand. Fair's conclusion was

that the California Personality Inventory did not distinguish personality variables sufficiently to be used as a predictive instrument.

At the University of Texas, Brown (1954) discovered from a study of the Dean's Honor List and the Scholastic Probation List that the underachievers were characterized by a delay tendency or a lack of decisive action, a tendency to procrastinate and an unwillingness to conform to routine and academic requirements. Furthermore, he found that this delay was not limited to the classroom only, but was exhibited in regard to activities usually regarded as being outside the classroom sphere.

At Ohio State University Ward (1960) focused attention upon the relationship of evaluative attitudes to scholastic achievement. His findings revealed that low achieving students scored significantly higher on economic values, whereas high achieving students scored significantly higher on aesthetic values. Again, the low achieving students expressed higher interest in the familiar and stable situations of life, whereas the high achieving students indicated preference for working with more abstract ideas and situations. Thus it would appear that values, interests, and needs must bear a significant relationship to academic achievement.

One more example of the study of the relationship of personality factors to academic achievement is found in the research reported by Skiff (1960). His study is unique in

that it started with certain personality traits and then examined their influence upon learning ability. Submissive and Ascendent persons were submitted to learning tasks under different situations, and it was discovered that a submissive subject can learn a task in which he is required to submit to rigid experimental conditions (such as learning nonsense syllables) better than an ascendent subject can, probably because the task is easiest learned with the attitudes and habits already possessed by the submissive person. When the ascendent person is motivated to submit to the restrictive conditions, however, his learning improves. It was also discovered that if the instructions were such as to change the mental set of the submissive person, and hence to a degree make him assume the habits of the ascendent person, he would learn with less advantage over the ascendent person. Hence, Skiff's findings indicate that submissive persons, left to their own devices, can learn a submissive task with fewer trials than can ascendent persons, and that strong motivation tends to lessen the difference between the two personality-type groups. It seems that more studies like this, where groups of contrasting personality types are submitted to achievement tasks under controlled conditions, could very profitably serve as a means of identifying the personality variables that are related to academic underachievement.

Prediction Studies. In the study of underachievement

at the college or university level, considerable attention has been given to that area of the problem concerned with the prediction of academic success. Especially has this been true on the Canadian scene where university admission policies have tended to be more selective. In an effort to find valid predictors of achievement at the University of Alberta, Zurowsky (1959) analyzed the results of grade IX tests, grade XII departmental examinations, and various standardized aptitude and achievement tests. From the validity coefficients that were calculated, Zurowsky concluded that the best prediction of academic achievement on the university level could be made from batteries including a number of variables. Not much confidence could be placed in any one of the predictive variables taken by itself. Of the various predictors examined, Zurowsky found the grade XII departmental examinations to be the most valid and the most practical, especially when used with the supplementary evidence from aptitude, achievement, and personality tests. The widespread use of departmental examinations for predictive and selective purposes is recognized by Jackson and Fleming (1957, p. 38) in their report of the Atkinson Study of the Utilization of Student Resources incorporated in Canada's Crisis in Higher Education. "Though the admission requirements of Canadian Universities vary widely," they observe, "they all have a common factor of reliance on the departmental tests."

Fleming on his own (1959) reports a study of personal

and academic factors as predictors of first-year success in the University of Ontario. Using the pass-failure-withdrawal criterion, he discovered the best predictors to be student's age, teacher's ratings on reliability, cooperation with teachers and students, and the attributes of initiative and industry. Using the first-year-grade-average criterion, he found the best predictor to be the grade XIII average. Averages from the other grades of high school were also useful, the effectiveness of the prediction generally increasing from grade IX on. Marks in single grade XIII departmental examinations and scores on aptitude tests were nearly always less useful than the grade XIII average. Fleming's conclusion is similar to that of Zurowsky when he makes the following suggestion:

> There is a strong possibility that a multiple correlation using the average on some or all of the grade XIII papers and aptitude scores in a predictive combination against the university average would be substantially higher than a single correlation. (Fleming, 1959, p. 19).

Hence, Fleming is strongly of the opinion that the use of two or more predictors is demonstrably superior to the use of a single one, and he suggests that the use of grade XIII average, teachers' ratings on chance of university success, and the appropriate aptitude test scores would result in reasonably good prediction and selection for successful academic achievement in the university.

Fitzpatrick (1956), who made a study of the prediction

of success in first-year engineering at the University of Alberta, points out that the validity index of prediction can be raised to about .80 when psychological tests are also included with high school averages in a multiple correlation against first-year marks. Nelson (1949), who also made a study of the prediction of achievement in first-year engineering at the University of Alberta, agrees that the best basis for the prognosis of first-year college grades is the student's previous record of academic achievement, but he claims that the correlations seldom exceed .70. He further points out that aptitude tests prove most valuable as predictors when they are based directly on the work for which the prognosis of aptitude is required. Also, he presents evidence to show that high scores on predictive instruments do not predict academic success to the extent that low scores predict academic failure.

Similar findings concerning the prediction of academic achievement have been reported from the American scene. Stone (1954), for example, explains that the problem of prediction must be broken down into three phases: prediction of general scholarship, prediction of scholarship in specific subjects, and differential prediction in major areas of the curriculum. Thus, predictive instruments or variables must be chosen according to their general or specific purpose. As with the Canadian researchers, he found that the most effective predictor variables consisted of high school grade-point average, some measure of scholastic aptitude, and an objective

measure of high school achievement (presumably comparable to the Canadian departmental examinations). He also stresses the fact that multiple correlations have proved more efficient in prediction than have zero-order correlations.

Attention has also been given to the relative merits of various predictive instruments and types of instruments. Deridder (1953) made a study of the American Council on Education Psychological Examination for College Freshmen (ACE), one of the most widely used instruments for the prediction of academic achievement, and reports that performance on it is fairly predictive of college survival and that probationary men in general score lower than any other group. Low scores on the ACE, however, have not been found to insure academic failure. Deridder's final conclusion was that errors in prediction based upon the ACE must be attributed to the personal-social-emotional adjustment of the individual. In comparing the predictive value of the ACE with high school standing, Frederikson (1952) found a correlation of .47 between the ACE and college grades, whereas the correlation of high school standing with the same criteria was .57. In comparing aptitude tests and achievement tests in general, Levine (1958) concluded that in practical prediction problems optimal forecasting efficiency could usually be obtained with a judicious combination of aptitude and achievement tests. Where many criteria are to be predicted, the battery may best

consist of verbal and quantitative reasoning tests plus a few other tests which measure more specific subject-matter content. The best predictor of a lone criterion, on the other hand, is often a specially devised test which combines the general features of an aptitude test with the specific characteristics of appropriate achievement tests.

Several other studies of prediction are worthy of mention. Forrest (1960), for example, has shown that indigenous information is important, for what will predict accurately for one school or for one student will not always predict accurately for another school or for another student. Thompson (1960) at the University of California and Munroe (1960) at the Sarah Lawrence College investigated the predictive value of the Group Rorschach test. Thompson's findings indicated that the instrument was a valid predictor of adjustment or motivational aspects of low achievement to the extent that a quantified scoring of the test papers gave a correlation of .38 with the criterion of semester psychology grades, and a correlation of only .04 with a measure of verbal aptitude. Munroe found that whereas the ACE was more successful in predicting success, the Rorschach was more successful in predicting academic failure.

These studies of prediction are vitally important to any investigation of academic underachievement, for it is only in the terms of such prediction that underachievement can be identified. Furthermore, the limitations of prediction

must be accepted as a calculated risk and a marginal error must be recognized when one is speaking of underachievement or classifying underachievers.

Studies of Motivation and Adjustment. It has been the feeling of some research scholars that differentiating characteristics and contrasting profiles, as comprehensive as such efforts might be, fall far short of the solution of the problem of underachievement among college students. In an effort to trace the causal relationships, investigators have given special attention to motivation and adjustment factors. Feder and Kounin (1940) observed that the highly motivated student shows greater correspondence between ability and achievement than does the one without such motivation. For example, definite career interest or vocational motivation tends to produce superior achievement. Also, interest in work and subject matter leads to greater success. In many cases the desire for the instructor's approval or for better grades stimulates more intense application and in turn greater achievement. Time spent on various activities appears to be proportional to the motivational intensity, and students tend to study with greater spontaneity and with greater personal satisfaction in courses which are more central to them. Likewise, students who must do some work for self-support are found to be more inclined to work toward academic success. In the light of these observations, Feder and Kounin suggest

that counseling efforts be concerned with motivational implications: the absence of needs, the absence of goals, and the barriers of psychological movement.

Anderson (1954) shares the concern for the motivational emphasis in the study of underachievement, but he raises a caution in regard to the so-called theory of "deficient" motivation and explains that it is an inadequate basis for the understanding of the problem of underachievement. It fails to take into account two basic psychological principles: first, that behavior may be and often is motivated by unconscious desires, and second, that individual differences prevail. He explains his point of view as follows:

> Considering the first of these principles, it may be assumed that students who have not applied themselves do not lack motivation but probably have unconscious negative attitudes that predispose them to failure. Regarding the second principle, it may be presumed that the motives predisposing one student to failure are likely to differ from the motives of another student. Furthermore, an empathic analysis of specific student problems will often reveal that unseen negative motives are sabotaging the efforts and ambitions of the individual. (Anderson, 1954, p. 209).

While recognizing that there are those in college who seem to possess solidified negative attitudes and who will probably be unable to benefit from preventative counseling, Anderson is convinced that much can be done to reduce the high incidence of underachievement among college students. "This work will be facilitated," he argues, "as soon as the true nature of motivation is more widely understood by college officials." (Anderson, 1954, p. 210).

At the University of Alberta, Woodhams (1958) made a study of underachievement and overachievement with special attention given to the matter of personality adjustment. Conjecturing that the student's total adjustment determines the degree to which he actualizes his academic potential, and also postulating that the anxiety of a poorly adjusted student has its source in feelings of social isolation, Woodhams hypothesized that the underachieving student employs the mechanism of overcompensation (endeavoring to excel in the area of felt deficiency) and that the overachieving student resorts to the mechanism of compensation (seeking recognition in the unrelated area of studies). In the first instance a disproportionate amount of energy would be directed towards social participation and other activities would suffer. In the second case, a disproportionate amount of energy would be directed toward a chosen compensatory area such as studies to the detriment of other areas of endeavor. Woodham's findings lent support to her hypotheses, for they showed that it was the non-intellectual variable of total adjustment, not over-sociability, that precludes scholastic success. Although over-sociability did not distinguish underachievers from overachievers, it did tend, however, to distinguish both underachievers and overachievers from normal achievers.

Hoyt and Norman express a similar view when they point out that "one student may defensively overcompensate for felt deficiencies through intensive concentration on

his studies; another may dwell on his felt problems to such lengths that he pays no attention to his studies, or finds himself unable to concentrate on them" (1954, p. 96). This conclusion was drawn from the results of a study at the University of Minnesota in which three groups--highly maladjusted, partially maladjusted, and a normal control group--were compared according to the correlations between achievement predicted on the basis of the Ohio State Psychological Examination and the achievement actually realized and reflected in the course grades. The correlation for the normals was .62, but that of the partially maladjusted dropped to .51 and that of the highly maladjusted dropped to the low level of .31. The maladjustment was assessed on the basis of the Minnesota Multiphasic Personality Inventory, and profiles with only one high peak were regarded as evidence of partial maladjustment. The trend of the correlations obviously lends strong support to the hypothesis that adjustment is a crucial factor in the problem of underachievement. Such a conclusion is also supported by the findings of Stagner (1933) which revealed correlations ranging from .37 to .45 between predicted achievement and actual achievement on the part of those showing maladjustment on the Bernreuter test, whereas correlations ranging from .59 to .71 resulted for those who showed no maladjustment.

Another study of the relationship between discrepant academic achievement and personality adjustment is reported

by Kunce (1960) who examined the records of psychiatric cases and compared them with a normal group matched for sex, class, and intelligence. He discovered that the mean discrepant achievement score for the experimental group was significantly higher than that of the control group. Hence, he concluded that the degree of discrepancy between intelligence and achievement is significantly related to indices of adjustment evidenced by the need for psychiatric treatment.

Although most investigators have found a significant relationship between adjustment and achievement as indicated above, the results of all the research have not been entirely consistent. Griffiths (1945), for example, found no significant differences in the grades of those who rated high and those who rated low on the Bell Adjustment Inventory. Although the differences were not found to be significant, however, Griffiths did note that some degree of positive correlation did exist in each case and concluded that the consistency of the differences, even though small, was in itself important. Hence, his final conclusion was that adjustment is a significant factor in academic achievement.

It is of interest at this point to note the conclusion of Gowen (1960) who, after attempting to organize the findings of various studies of underachievement into a meaningful whole, made the following statement in Freudian terms:

> Achievement is an indication that the individual has successfully transferred a large enough portion of his basic libidinal drives to areas of cultural accomplishment so that he derives a significant portion of his

> gratifications from there. We need always to consider how an individual is to receive psychological pay for tasks accomplished. . . . The success of education can be measured by the degree of this transformation asit occurs in the individual, or by the percentage of the group brought to a reasonable level of achievement. The problem of underachievement, then, is a direct challenge to education in the central task of aculturation. (Gowen, 1960, p. 95).

Such a process of libidinal transfer and aculturation is obviously a task of adjustment related to academic achievement.

Other Approaches. The review of related literature reveals several other approaches to the problem of underachievement which do not fall readily under the classifications discussed above. Trueblood (1957), for example, made a study of the effects of employment on academic achievement at Indiana University. The results of the study indicated that working while enrolled as a full-time student did not affect grade-point averages adversely. In most cases, in fact, the working student made a higher grade-point average than the all-university average, but not to the point of statistical significance. It was hypothesized that twenty hours of employment was the maximum which a student could take without suffering underachievement, but this was not confirmed with statistical reliability. Trueblood's conclusion, therefore, was that working time could not be said to have a significant adverse or positive effect upon the academic achievement of Indiana University students.

Chambers (1957) focused his attention upon the problem of "empathy" which he defined as "the imaginative transposing of oneself into the thinking, feeling, and acting of another and so structuring the world as he does" (1957, p. 282). From the results of his investigations with the Bender-Hastorf test and the ACE, he concluded that empathy as well as scholastic aptitude is significantly related to scholastic success. Furthermore, he discovered that when scholastic aptitude is held constant, empathy evidently is the different quality which enables the student to have scholastic success in spite of low scholastic aptitude.

It should be apparent from the review of related literature thus far that the investigation of the problem of academic underachievement on the college or university level has been approached from a variety of angles and that a number of specific problem areas have been focused upon. Attention will now be turned to the methods that have been employed in such studies.

RESEARCH DESIGN AND TECHNIQUE

Just as wide variety has been observed in approach and in problem areas, so there appear to have been numerous research designs and techniques employed in the study of academic underachievement. Of special concern to this study are the means by which underachievers have been identified and the psychometric procedures that have been employed.

Identification of Underachievers. Academic underachievement is usually defined in terms of the deviation of actual achievement from predicted achievement, the underachievers being identified as those who fall short of their predicted level, and the overachievers as those who exceed their predicted level. Some investigators have refrained from the use of the term "over-achievers", apparently because they question the consistency of implying that one can achieve beyond his capacity. Those who use the term, however, would make it relative to the best estimate of capacity and not to the real or actual capacity which eludes exact measurement or prediction. Most investigators, then, have accepted aptitude test scores, achievement test scores, or past grade records as measures of capacity and have identified underachievers and overachievers as those whose academic achievement did not conform to the expected performance.

Underachievers have often been identified in terms of statistical deviation. Altus (1948), for example, computed sigma scores for each member of his population both for aptitude test performance and for grade achievement. Those whose grade achievement reached a level .5 sigma higher than their aptitude test performance he regarded as overachievers, and those whose grade performance fell to a level .5 sigma below their aptitude test performance he classified as underachievers. Gordon (1959) employed the same technique, except that she set the cut-off points at plus or minus 1.0 sigma instead of

at plus or minus .5 sigma as Altus did. Diener (1960) followed essentially the same principle by defining deviation in terms of T-scores, regarding as underachievers those whose grade achievement fell fifteen points below that which they had earned in aptitude test performance, and overachievers as those whose grade achievement reached a level fifteen T-score points higher than that which they had made on the aptitude test. Similarly, Shaw and Brown (1957) identified their underachievers by means of percentile ranking, selecting for the underachieveing group those who ranked above the seventy-fifth percentile on the aptitude test, but who fell below the fiftieth percentile on grade-point average. These they compared with a control group of normal achievers who likewise ranked above the seventy-fifth percentile on grade-point average. This system of identifying underachievers by means of deviation in percentile rank was also used by Baymur and Patterson (1960).

A slightly more rigorous method of identifying underachievers has made use of regression equations of both single and multiple order, where grade achievement is predicted from one or more measures of capacity. Underachievers and overachievers, accordingly, are usually regarded as those who fall outside the standard error of estimate range of the regression equation. Thus Woodhams (1958) set plus or minus .7 standard error of estimate as the limits of normal achievement, and those exceeding these limits she classified as

overachievers and underachievers. Drought (1957) made similar use of the regression equation as a means of identification.

Another system of classifying levels of achievement might be spoken of as the ratio method, where the ratio of aptitude and grade indexes are computed and limits of normal deviation are set. Chabassof (1959) followed such a system, first by computing the ratio between aptitude test and achievement test percentiles for the first sorting of the population, and then by computing the ratio between scaled score averages on achievement tests and the percentile ranks on the aptitude test for the final selection of underachievers.

Groups of underachievers and overachievers have also been selected by means of matching. This method lacks the statistical rigor of the systems described above, but it does tend to bring together individuals of comparable ability. Coleman (1960), for example, selected high achievers with a grade-point average above 3.5 and low achievers with a grade-point average below 2.5, but both groups were matched for academic classification and equal ability as measured by the ACE. Likewise, Davidson (1950) matched a group of drop-outs with a corresponding group of sophomores who had returned for their second year of college, and Fair (1959) matched a group of probationers with a corresponding group of normals. Field (1954) selected individuals from the top third of his population group and matched them for age, major field of

study, and intelligence with a corresponding group from the bottom third of the population.

Other investigators have given more attention to ability level in their selection of underachievers and overachievers. From a pool of students predicted to be low achievers, Reed (1959) selected two contrasting groups for comparison, one made up of individuals earning a grade-point average of 1.0 or less, and the other earning a grade-point average of 2.0 or more. Morgan (1952), on the other hand, selected two contrasting groups from a pool of high ability students, using grade-point averages as the means of distinction. At Brigham Young University, Jensen (1958) combined the selection methods used by Reed and Morgan in order to secure four groups for comparison--achieving versus nonachieving students of low ability, and achieving versus nonachieving students of high ability. On the junior high school level, Calhoun (1956) identified underachievers simply in terms of disparity between mental age and chronological age.

Psychometric Procedures. The most commonly used measures of scholastic aptitude on the college level to be used in connection with underachievement studies have been the American Council on Education Psychological Examination for College Freshmen (ACE), the School and College Ability Tests (SCAT) prepared by the Cooperative Test Division of the Educational Testing Service, the Scholastic Aptitude

Test (SAT) prepared by the College Entrance Examination Board, and the Ohio State University Psychological Examination. Of these four instruments for the measurement of scholastic abilities, the use of ACE has been by far the most extensive, probably because of its nation-wide norms rather than any particular superiority. The four tests are, in fact, quite comparable, and each is intended primarily as a measure of a student's ability to succeed in future academic work. Such comparability is evidenced by the fact that correlations between SCAT and either ACE or SAT run well into the eighties (SCAT Manual, pp. 19-20). In spite of the extensive use of these psychometric instruments, it should be observed that their correlation with college grades is not too high, the reported figures clustering in the low fifties (Anastasi, 1954, p. 223; Cronbach, 1949, p. 180). Such weak correlations should warn investigators against being too dogmatic in their identification of overachievers and underachievers, especially when one of these tests is used as the sole index of scholastic ability.

The most widely used instruments for the study of the personality variables related to scholastic underachievement have been the Minnesota Multiphasic Personality Inventory (MMPI) and the Edwards Personal Preference Schedule (EPPS). In addition to several validity scales, the MMPI yields scores for nine major personality variables: Hypochondrias, Depression, Hysteria, Psychopathic, Tendency, Masculinity-Femininity, Paranoia, Psychasthenia, Schizo-

phrenia, and Hypomania. Other minor scales yield scores for Social Isolation, Dominance, Prejudice, Responsibility, Ego-strength, and Dependency. These scales, particularly the major ones, are obviously named according to the abnormal manifestation of the symptomatic complex. The authors claim, however, that they have significance and meaning within the normal range and that the test was designed partly to lessen the conflict between the psychiatrist's conception of the abnormal personality and that of psychologists and other professional workers who must deal with abnormality among more nearly normal people. (Hathaway, 1951, pp. 6-7). It has been the investigators most concerned with the relation of personality disturbance and adjustment to academic under-achievement who have made the most extensive use of the MMPI.

The Edwards Personal Preference Schedule yields scores for fifteen personality variables: Achievement, Deference, Order, Exhibition, Autonomy, Affiliation, Intraception, Succorance, Dominance, Abasement, Nurturance, Change, Endurance, Heterosexuality, and Aggression. In addition to these the test provides measures of Consistency and of profile stability. These variables appear to be more closely related to normal personality, and this probably accounts for the wide usage of the EPPS as a psychometric instrument for the analysis of the relation of personality factors to academic underachievement. One of the claims of the authors of the test is, in fact, that it avoids the unpleasant connotations of abnormal

psychology:

> A number of personality inventories purport to measure such traits as emotional stability, anxiety, adjustment, or neuroticism. Still other inventories purport to measure such clinical and psychiatric syndromes as schizophrenia, paranoia, or hsyteria. High and/or low scores on these inventories have associated maladjustive or clinical connotations. For research and counseling purposes, where it is often desirable to report back scores to subjects, such inventories present definite problems. These connotations are less likely to be attached to the variables in the EPPS. (EPPS Manual, 1959, p.6).

Another unique feature of the EPPS is the manner in which it endeavors to eliminate the bias resulting from the yes/no type of response and from the influence of social desirability that may be involved. Studies have been reported (EPPS Manual, 1959, pp. 5-6) which indicate that such bias is rather strong, so the EPPS items are paired with equal weights on a social desirability scale and in such a manner as to allow for the indication of preferance rather than a positive ar negative response. Dicken (1959) recognizes the bias that can creep into personality tests and describes it in terms of "simulation" which can result from deliberate faking, an ideal self-concept rather than a candid self-appraisal, or responses in terms of an "honest" but inaccurate or uninsightful self-assessment. Accordingly, Dicken made a study of the simulability of the EPPS and discovered that large and reliable changes resulted from four role-playing experiments where the subjects were instructed to present themselves as possessing the traits which various scales were designed to measure. The conclusion drawn from the study was that the EPPS effort to control the social

desirability factor was not too successful. Although this study is by no means conclusive, the evidence it presents contrary to the findings and claims of the authors of the EPPS suggest that the results of the test should be accepted with some caution and reserve.

The question might be raised as to the relationship between the MMPI and the EPPS which have been used so widely as psychometric instruments in the study of academic underachievement. Inorder to solve this problem, Allen (1957) administered both of the tests to over a hundred college undergraduates and discovered that only five of the intercorrelations between variables revealed significant relationship. His conclusion was that the EPPS and the MMPI, in general, were fairly independent in regard to the areas which they presumed to assess.

Although the MMPI and the EPPS have been most widely used in the study of academic underachievement, other psychometric instruments have been employed. Cash (1954) and Stagner (1933) used the Bernreuter Personality Inventory which was developed by factor analysis for the measurement of personality traits and yields scores for six dimensions: neuroticism, self-suffiency, introversion, dominance, confidence, and sociability. Other investigators such as Davidson (1950), Drought (1938), and Griffiths (1945) have made use of the Bell Adjustment Inventory which was designed to measure adjustment in four areas: home, health, social, and emotional.

For the investigation of interests related to academic achievement, Strong's Vocational Interest Blank and Kuder's Preference Record have been widely used and for the study of the relation of values to underachievement the Allport-Vernon-Lindzey Study of Values (theoretical, economic, aesthetic, social, political, and religious) has generally been used. Occasional reference in studies of academic underachievement has been made to such psychometric instruments as the California Personality Inventory, the Johnson Temperament Analysis, the Thematic Apperception Test, and the Group Rorschach test. Study habits related to underachievement have been investigated by means of the Wrenn Study-Habits Inventory and the Brown-Holtzman Survey of Study Habits and Attitudes.

CHAPTER III

RESEARCH RELATED TO THE EPPS AND SSHA VARIABLES

Various findings have been observed incidentally in connection with the foregoing discussion of the general research related to the study of academic underachievement. All of this has significant bearing upon the present study and provides helpful orientation, but further attention should be directed specifically to those findings directly related to the problem areas with which the present study is concerned--those defined by the Edwards Personal Preference Schedule and the Brown-Holtzman Survey of Study Habits and Attitudes.

ACHIEVEMENT has been defined in the EPPS Manual as a manifest need:

> To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something or great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play. (1959, p. 11).

Several investigators have found this variable to be significantly related to academic achievement or grade-point average. Bendig's study (1958) at the University of Pittsburg revealed a correlation of .23, significant at the .01 level of confidence. At the University of Arkansas, Diener (1960) found a significant difference equivalent to the .05 level between overachievers and underachievers. Likewise,

Krug (1959), in his study of performance-based and aptitude-based prediction, found the achievement variable to distinguish overachievers from underachievers in both situations. Ward also (1960), in his four-group study of low-ability high achievers and low achievers and high-ability high achievers and low achievers, discovered that the need for achievement was significantly related to high achievement on both levels. Burgess (1956) found a similar relation between the need for achievement and high grade-point average among engineering students at Pennsylvania State College.

Although different psychometric instruments seldom, if ever, define and measure variables in exactly the same way, studies have been made with instruments other than the EPPS which lend support to the EPPS indications that there is a significant relation between the need for achievement and academic achievement. Fair (1959), for example, found achievement via conformance, as measured by the California Personality Inventory, tending to distinguish probation students from non-propationers. Malloy (1955) concluded from his life experience inventories that overachievers were characterized by the need for achievement, and Morgan (1952) found the same tendency expressed in stories written in response to the Thematic Apperception Test. Van Dalsen's questionnaire data (1956) showed high achievers to be high in "aspiration level", and Gough's evidence (1953) revealed among them a "sense of accomplishment". Likewise Field (1954)

found the overachievers to be characterized by "inquiring intellect". The later characterizations, of course, are not to be considered as identical to the EPPS need-achievement variable, but they do suggest a similar tendency. In spite of the mounting evidence in favor of the significance of the relation between need for achievement and academic achievement, both Marsh (1954) and Reed (1959) report that no evidence could be detected in their findings for such a relationship.

DEFERENCE has been defined in the EPPS Manual as a manifest need:

> To get suggestions from others, to find out what others think, to follow instructions and do what is expected, to praise others, to tell others that they have done a good job, to accept the leadership of others, to read about great men, to conform to custom and avoid the unconventional, to let others make decisions. (1959, p. 11).

As in the case of the need for achievement, so the need for deference has been found to characterize the high achieving college or university student, although the evidence is somewhat contradictory. Coleman (1960) found high achieving moderate-ability students at the Oklahoma Baptist University to be significantly characterized by a deference tendency, and accordingly he suggests that overachievers conform more readily to accepted practices and assume leadership roles more readily. Both Reed (1959) and Diener (1960) also found overachievers and underachievers to be significantly distinguished by the deference trait, the overachievers

being the more deferent in both cases. Krug (1959), on the other hand, did not find deference to characterize the overachievers, but rather he found high ability students scoring low on deference with a corresponding significant interaction between ability level and achievement level on the deference scale. Thus Krug's findings would suggest that deference is more directly related to ability level than achievement level.

Other findings have been reported which are similar to but not identical to the EPPS variable of deference, and here again the evidence is contradictory. As was observed above, Fair (1959) found a significant but low correlation between achievement via conformance and grade-point average, but Malloy (1959) found the low achievers to be the conformists and the high achievers the non-conformists. The evidence shifts again, however, in Field's study (1954), for he found the high achievers to be characterized by conformity. Gough (1953) likewise discovered the overachievers to be the ones who were inclined to accept conventions. In the light of this contradictory evidence, although its weight tends to favor a significant relation between deference and high achievement, serious attention no doubt should be given to the interaction of ability suggested by Krug (1959) and the influence of a submissive temperament in various learning tasks as demonstrated by Skiff (1960).

ORDER has been defined by the EPPS manual as a manifest need:

> To have written work neat and organized, to make plans before starting on a difficult task, to have things organized, to keep things neat and orderly, to make advance plans when taking a trip, to organize details of work, to keep letters and files according to some system, to have meals organized and a definite time for eating, to have things arranged so that they run smoothly without change. (1959, p. 11).

Some evidence of the relation of order to academic achievement has been reported, but not to the extent as has been the case with the needs for achievement and deference. Diener (1960) found significant differences at the .05 level of confidence between his underachievers and overachievers, with the high score on order favoring the overachieving students. Likewise Krug (1959), in his study of performance-based and aptitude-based identification of underachievement and overachievement, found significant distinction in the case of the aptitude-based sample favoring the overachievers in the matter of order. The variable of need for order failed to distinguish the overachievers from the underachievers, however, in the case of the performance-based sample, again suggesting that complex and interacting factors are at play in the over-all problem of academic underachievement. Further evidence for the association of orderliness with high achievement was also found by Gough (1959) who did not use the EPPS, but an instrument made up of a pool of items taken from other tests.

EXHIBITION has been defined in the EPPS Manual as a manifest need:

> To say witty and clever things, to tell amusing jokes and stories, to talk about personal adventures and experiences, to have others notice and comment upon one's appearance, to say things just to see what effect it will have on others, to talk about personal achievements, to be the center of attention, to use words that others do not know the meaning of, to ask questions others cannot answer. (1959, p. 11).

Very little evidence of a significant relationship between the need for exhibition and academic achievement has been found. Of all the reports of studies examined in this review, Reed alone (1959) submits such evidence. His findings indicate that overachievers tend to be less exhibitionistic than do underachievers.

AUTONOMY has been defined in the EPPS manual as a manifest need:

> To be able to come and go as desired, to say what one thinks about things, to be independent of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what others may think, to criticize those in positions of authority, to avoid responsibilities and obligations. (1959, p. 11).

Of those who have used the EPPS in thestudy of academic achievement, only Reed (1959) has reported a significant relationship for autonomy. He found overachievers to be less autonomous than underachievers. In spite of this lack of evidence for autonomy from the use of the EPPS, however, other psychometric instruments have revealed findings that might be regarded as roughly comparable to the EPPS variable of autonomy. Cash (1954) found a significant relation between

"self-sufficiency" as measured by the Bernreuter test and grade-point average. Morgan (1952) reports that achievers scored significantly higher than non-achievers on a "self-confidence" scale drawn from the MMPI, and Gough (1953) found similar results from his pooled items referred to above. Likewise Hinkelman (1952) found through the use of the Johnson Temperament Analysis for Personality that "objectivity", "composure", and "self-mastery" were highly related to achievement and tended to facilitate the learning process. Altus (1948), through the use of the MMPI, found "fearlessness", and "self-assertiveness" to characterize the non-achiever rather than the achiever, but Malloy (1955), through the use of his Life Experience Inventory, found the overachiever to be characterized by an attitude of "independence". Thus these variables might be regarded as forming a kind of syndrome around the EPPS concept of autonomy, but the evidence concerning their relationship to academic achievement and to each other is obviously vague and confusing.

AFFILIATION has been defined in the EPPS Manual as a manifest need:

> To be loyal to friends, to participate in friendly groups, to do things for friends, to form new friendships, to make as many friends as possible, to share things with friends, to do things with friends rather than alone, to form strong attachments, to write letters to friends. (1959, p. 11).

Reed (1959) and Krug (1959), both using the EPPS, found overachievers to rate significantly lower than underachievers on the affiliation scale. Likewise Burgess (1956) and Owens

(1949), using other standardized personality inventories, found the underachievers to exhibit the greater rapport in social situations, and Malloy (1955) found the underachievers to be socially minded in a conformist manner, the overachievers tending to have friends in a non-conformist manner. Contrary to the evidence showing the underachievers to be stronger in affiliation, however, is that found by Fair (1959) through the use of the California Personality Inventory, where he reported some positive correlation between socialization and grade-point average. Morgan (1952) using the MMPI, found the overachievers to rate high on other-centeredness, and Gough (1953) found it was the overachievers who were characterized by acceptance of others. Again, contradictory results have emerged from studies of gifted students, for Gowen's evidence (1953) showed the gifted underachievers to be unsociable, but Strang's evidence (1956) indicated that it was the gifted underachievers who needed to be socially accepted. Woodhams (1958), it will be recalled, endeavored to solve this contradiction by producing evidence indicating not that sociability or affiliation differentiates between underachievers and underachievers, but both from normal achievers, thus reflecting adjustment more than sociability or affiliation per se.

INTRACEPTION has been defined in the EPPS manual as a manifest need:

To analyze one's motives and feelings, to observe

> others, to understand how others feel about problems, to put one's self in another's place, to judge people by why they do things rather than by what they do, to analyze the behavior of others, to analyze the motives of others, to predict how others will act. (1959, p. 11).

No evidence has been found that would indicate a significant relationship between this variable of intraception to academic underachievement or overachievement.

SUCCORANCE has been defined in the EPPS manual as a manifest need:

> To have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others be sumpathetic and understanding about personal problems, to receive a great deal of affection from others, to have others do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, to have a fuss made over one when hurt. (1959, p. 11).

The only investigation of underachievement which attaches significance to succorance is that reported by Krug (1959) who examined the influence of ability levels upon the relationship of personality factors to underachievement. Succorance was one of the EPPS scales which he found to interact significantly with ability level.

DOMINANCE has been defined in the EPPS manual as a manifest need:

> To argue for one's point of view, to be a leader in groups to which one belongs, to be regarded by others as a leader, to be elected or appointed chairman of committees, to make group decisions, to settle arguments and disputes between others, to persuade and influence others to do what one wants, to supervise and direct the action of others, to tell others how to do their jobs. (1959, p. 11).

Coleman (1960) found the dominance trait as measured by the

EPPS to be significantly lacking among high achieving students of moderate ability, but Reed (1959), on the other hand, found a general group of overachievers to be distinguished from the underachievers by the dominance variable. Krug (1959) found dominance to differentiate between high-ability and low-ability students, but not necessarily between high achievers and low achievers. Morgan's findings (1952) lend support to those of Reed in that he discovered that dominance, as measured by the MMPI, was significantly characteristic of high achievers.

ABASEMENT has been defined in the EPPS manual as a manifest need:

> To feel guilty when one does something wrong, to accept blame when things do not go right, to feel that personal pain and misery suffered does more good than harm, to feel the need for punishment for wrong doing, to feel better when giving in and avoiding a fight than when having one's own way, to feel the need for confession of errors, to feel depressed by inability to handle situations, to feel timid in the presence of superiors, to feel inferior to others in most respects. (1959, p. 11).

Only Drug (1959) has found abasement as measured by the EPPS to have any significant relationship in the study of academic underachievement. His findings indicated that high ability students show significantly less abasement than do low ability students, but the variable does not differentiate between high achievement and low achievement.

NURTURANCE has been defined in the EPPS manual as a manifest need:

> To help friends when they are in trouble, to assist

> others less fortunate, to treat others with kindness and sympathy, to forgive others, to do small favors for others, to be generous with others, to sympathize with others who are hurt or sick, to show a great deal of affection toward others, to have others confide in one about personal problems. (1959, p. 11).

No significant relation of this variable to academic underachievement has been found in the research reports reviewed.

CHANGE has been defined as the EPPS variable which measures the manifest need:

> To do new and different things, to travel, to meet new people, to experience novelty and change in daily routine, to experiment and try new things, to eat in new and different places, to try new and different jobs, to move about the country and live in different places, to participate in new fads and fashions. (1959, p. 11).

Although all the investigators who have used the EPPS have not found change to be a significant variable, Coleman (1960) and Reed (1959) agree in reporting that high achievers rate significantly lower than do low achievers in this respect. Burgess, likewise, found overachievers to be less "labile", a concept which is comparable to the EPPS concept of change. Fair's results (1959), on the other hand, showed "flexibility" as measured by the California Personality Inventory to correlate positively with grades, and Field (1954) from his battery of personality tests concluded that the high achievers were more "liberal". Thus the evidence is again found to be inconclusive.

ENDURANCE has been defined in the EPPS manual as the manifest need:

> To keep at a job until it is finished, to complete

> any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work. (1959, p. 11).

For this variable fairly consistent findings have been reported. Not all the researchers who have used the EPPS have found endurance to be a significant variable in academic underachievement studies, but Reed (1959), Diener (1960), and Krug (1959) agree in reporting that overachievers show more endurance than do underachievers. Malloy's Life Experience Inventory (1955) revealed the same tendency, and Gough (1953) concluded from his studies that overachievers are characterized by "sustained and diligent application."

HETEROSEXUALITY has been defined by the EPPS manual as a manifest need:

> To go out with members of the opposite sex, to engage in social activities with the opposite sex, to be in love with someone of the opposite sex, to kiss those of the opposite sex, to be regarded as physically attractive by those of the opposite sex, to participate in discussions about sex, to read books and plays involving sex, to listen to or to tell jokes involving sex, to become sexually excited. (1959, p. 11).

Krug (1959) has been the only investigator to report a significant relationship between heterosexuality as measured by the EPPS and academic achievement. He found high-ability students to score high in heterosexuality, but high achieving students were found to rate significantly low. Other investigators, though not dealing particularly with the EPPS psychometric variable, have also found evidence of some

relationship between heterosexual tendencies or practices and academic achievement. Anspaugh (1953) found restricted dating to be characteristic of the high achieving students of a high school population, but Malloy (1955) found through his Life Experience Inventory that it was the underachievers in a college population who dated less regularly than the average. It should be observed at this point that these last two investigations are concerned with what individuals actually do, whereas the EPPS measurement of heterosexuality endeavors to assess need in that area. There may be a difference to explain the lack of consistency in the findings.

AGGRESSION has been defined by the Epps manual as a manifest need:

> To attack contrary points of view, to tell others what one thinks about them, to criticize others publicly, to make fun of others, to tell others off when disagreeing with them, to get revenge for insults, to become angry, to blame others when things go wrong, to read newspaper accounts of violence. (1959, p. 11).

No significant findings have been reported for the relationship between aggression as measured by the EPPS and academic achievement.

Findings Related to the Brown-Holtzman Survey of Study Habits and Attitudes. The Brown-Holtzman Survey of Study Habits and Attitudes (SSHA) is a general test, yielding a single composite score, and does not define specific and separate variables as does the EPPS. Even though the test was designed to investigate both study habits and study

attitudes, these two factors are not distinguished in the test form or in the scoring. Furthermore, few of the studies of academic overachievement and underachievement have made use of the SSHA as a psychometric instrument. For these reasons, the findings of research concerning the relation of study habits and attitudes to academic achievement must be dealt with in more general terms than was the case with the specific variables related to the EPPS.

One would expect the SSHA to bear a close relationship with grades, for the instrument was designed to correlate little with measures of scholastic aptitude, but highly with academic success. Validation studies (7, p. 6) have shown such correlations with grade-point averages to be .42 for college men and .45 for college women, whereas the correlations between SSHA and ACE averaged .34 and .25, respectively. These correlations are in line with the stated purpose of the SSHA:

> To identify students whose study habits and attitudes are different from those of students who earn high grades, to aid in understanding students with academic difficulties, and to provide a basis for helping such students to improve their study habits and attitudes and thus more fully realize their best potentialities. (Brown-Holtzman, 1959, p.3).

It is obvious from the design and purpose of the SSHA that it should serve to differentiate underachievers from overachievers or normal achievers. Such a conclusion has recently been corroborated by Popham (1960), who made a validity check upon the Brown-Holtzman Survey of Study Habits and Attitudes

and the Brown College Inventory of Academic Adjustment. His computation of correlations and differences revealed a significantly stronger relationship between subjects' scores on either instrument and academic grades than between the students' scores on either instrument and the ACE. Accordingly, Popham concluded that the SSHA and the Brown College Inventory of Academic Adjustment do, in fact, measure something other than intellectual aptitude which is associated with academic success and may, therefore, aid the identification of potential academic overachievers and underachievers. Furthermore, he concluded that the most critical non-intellectual factors associated with student academic success may lie more directly in the realm of study activity as revealed by the SSHA than in the several areas of academic adjustment assessed by the Brown College Inventory of Academic Adjustment, such factors as personal efficiency, mental health, and personal relations.

Davidson (1950) found in a study of drop-outs from the University of Alberta that they suffered significantly more study difficulties than did a matched group of students who returned for another year at the university. An item analysis of the Wrenn Study-Habits Inventory showed the experimental group to have more concentration difficulty, more anxiety in examinations, and more dislike for subjects. Brown (1954), in his study of the action-delay among probation list and Dean's list students, concluded that the low achieving students

were inclined to rely upon strong and immediate motivation to begin studying, whereas the high achieving students were more prompt in their response to the demands of study. As for the overachiever, Malloy (1955) reports finding them working alone and meeting deadlines, and Owens (1949) reports that they are inclined to spend a lot of solitary time in study.

Rust (1958) reports an interesting study of underachievement at Yale University which involved a questionnaire analysis of three groups--underachievers, overachievers, and normal achievers as they were identified by prediction from secondary school grades, achievement tests, and aptitude tests. The study revealed that the three achievement groups reported essentially similar study habits in secondary school but quite different study habits in college. The overachievers, in particular, consistently and significantly reported that at college they spent more time in study, seldom missed class, were more likely to work the same times each day, were less distractible, got reports and papers in on time, took better notes, worked with greater efficiency during exams, and were less likely to be lured away from studying. Accordingly, it was Rust's conclusion that the change in academic achievement from secondary school to college is associated with a change in behavior favorable to good grades. Furthermore, such changes in study habit patterns are not so much the function of personality changes in the subjects, but of

changes in the environment which differentially affect the established personality patterns already existing in the college students. A further check of the values held and practiced by the students indicated that the tendency of habits and attitudes favorable to good grades is related to the degree to which such values have been adopted by the student as his own.

SUMMARY OF OBSERVATIONS FROM RELATED LITERATURE

1. The problem of academic underachievement has been investigated at all levels of the educational ladder.

2. There has been active investigation of the problem of academic underachievement on the Canadian as well as the American scene.

3. The problem of academic underachievement has been approached from a variety of angles with attention focused upon a variety of specific problem areas: prediction problems, life-experience correlates, personality factors, study habits and attitudes, motivation and adjustment.

4. Overachievers and underachievers have been identified in terms of the deviation of actual from predicted academic performance.

5. Research procedure has consisted mainly of comparing overachievers with underachievers by means of psychometric analysis and survey data, occasionally by clinical observation.

6. The most commonly used instruments for the study of academic underachievement have been the Minnesota Multiphasic Personality Inventory and the Edwards Personal Preferance Schedule, the later gaining favor because of fewer connotations of abnormal psychology.

7. Considerable evidence has been submitted which indicates that the following personality needs are significantly related to successful academic endeavor: achievement, deference, autonomy, and endurance.

8. There is occasional evidence that the following personality needs are significantly related to successful academic endeavor: order, affiliation, dominance, and change.

9. There is little or no evidence that the following personality needs are significantly related to successful academic endeavor: exhibition, intraception, succorance, abasement, nurturance, heterosexuality, and aggression.

10. Several investigators have found no personality variables significantly related to academic underachievement, and in practically every case contradictory findings are reported.

11. There is strong evidence that study habits and attitudes are closely related to academic success.

CHAPTER IV

ORIENTATION AND PROCEDURE OF THE STUDY

The general problem of academic underachievement was considered in the first chapter of this report, with attention given to the disturbingly high incidence of such underachievement during the present complex age with its urgent demand for better education on the one hand and generous educational opportunities on the other hand. The peril of the situation was observed in that academic underachievement means failure and curtailment of effective living for the individual, unprofitable expenditure of time and money for the school, and the failure to realize the full potential of human resources on the part of society. The need for study and research in connection with the problem was recognized as arising out of the confusing and contradictory results of previous investigations and from the unique situation presented by the selective matriculation policies of the Canadian universities. In the light of these general considerations, an exploratory examination of records in the office of the Faculty of Education and in the Guidance Center of the University of Alberta revealed evidence that academic underachievement was a problem there as well as in other colleges and universities. It was proposed, therefore, that an analysis of academic underachievement as it prevails among education students at the University of Alberta be made.

ORIENTATION OF THE STUDY

Research Population. Although the problem of academic underachievement appeared to prevail throughout the various faculties of the University of Alberta, it seemed wise to limit this investigation to students studying in the Faculty of Education. Other studies have been made of Arts and Science (Woodhams 1958), Engineering (Fitzpatrick, 1956), and scattered underachieving students (Davidson, 1950), but no investigation of the problem of underachievement among Education students at the University of Alberta has been reported. Furthermore, the selection of students from the single Faculty of Education should provide an element of homogeneity in that the subjects of the research population would be taking approximately the same courses and working under the same conditions. Such homogeneity should add reliability to the findings of the investigation.

Research Sample. It was further decided that a representative sample of Education students should be drawn from the enrollment of a single year, for whom certain necessary information was on record, and who were enrolled again the following year and were thereby available for the required testing. Accordingly, the first-year Education students of the school year 1958-1959 were selected as the group for specific study. Early in that year these students took the Cooperative School and College Ability Tests (SCAT),

and the record of their scores was available at the University Guidance Center for authorized research purposes. Some of the group did not return for the following year, of course, but it appeared from the records that confining the study to the returning students would not seriously impair the representativeness of the sample. It was also assumed that the various personality factors to be examined the following year were sufficiently constant to make the findings of the study significant and valid. Other investigators (Rust, 1960) have reported such a constancy of basic personality traits not only from year to year but from high school to college. Selecting the 1958-1959 first-year Education students who returned for the following year and whose records showed SCAT scores and grade averages for the first year yielded a list of 157 students from which sub-groups of underachievers, normal achievers, and overachievers could be drawn.

Identification of Underachievers and Overachievers. In order to define academic achievement in relative terms as underachievement and overachievement, it is necessary to have some index of achievement and some reference point such as an index of scholastic ability. Various achievement tests, such as the Sequential Tests of Educational Progress, could be given, but the review of related literature has indicated that college or university grades are most commonly accepted as the index of achievement. Accordingly, the grade averages

earned by the members of the research sample during the school year of 1958-1959 were secured from the records in the office of the Faculty of Education. The grades of full-time courses and part-time courses were weighted in the usual manner so that the resulting grade average would be a true index of the individual's academic achievement insofar as the limitations of classroom evaluation would allow.

The Cooperative School and College Ability Test scores, referred to above, were chosen to serve as the index of academic ability or scholastic aptitude. Although the review of related literature has indicated that no single test is likely to serve as a maximum predictor of academic performance and that prediction from a regression equation developed from a battery composed of achievement tests, aptitude tests, and high school grades would prove to be the most efficient, it seemed most appropriate for this study to use the SCAT grades alone as the index for academic ability. Whereas prediction is generally concerned with the forecasting of actual performance, this study with its concern for the identification of underachievers need an index of capacity to perform. The prediction of actual performance is obviously strengthened by consideration of what has already been done as measured by high school grades and achievement tests, but SCAT focuses attention upon capacity. According to the authors of SCAT, the various forms of the test "were designed to aid in estimating

the capacity of a student to undertake the next higher level of schooling" (SCAT Technical Report, p. 5), and the test endeavors to measure four kinds of ability: the comprehension of the "sense" of sentences, the attaching of meaning to isolated words, the manipulation of numbers and the application of mathematical concepts in computation situations, and the solving of quantitave problems. Of course it is difficult to ascertain how well the instrument measures what it purports to measure, but high reliability coefficients ranging in the nineties have been reported (SCAT Technical Report), and the strong correlations of SCAT with ACE and SAT, for which extensive validity studies have been made, serve to affirm its own validity. Hence, because SCAT focuses upon the measurement of capacity, because it appears to be comparable to the more popular ACE in both reliability and validity, and because it was used during 1958-1959 by the Guidance Center of the University of Alberta for the measurement of scholastic aptitude, it was chosen to provide the index of academic ability in this study.

In order to put both SCAT scores and grade averages on a comparable basis, standard scores were computed by finding the means and standard deviations and then dividing each individual deviation (Garrett, 1958, pp. 312-314). These standard scores are listed in Table I and in Table II on the following pages. The deviations of the standard scores for grades from the standard scores for SCAT are also listed in

TABLE I

IDENTIFICATION OF UNDERACHIEVERS*

Student	Ability Index SCAT -	Achievement Index Grades -	Deviation
1.	.44	-.12	.56
2.	-.13	-1.51	1.38
3.	1.67	-.61	2.28
4.	.20	-1.13	1.33
5.	1.51	.64	.87
6.	-.46	-1.16	.70
7.	.20	-2.40	2.60
8.	.52	-.31	.83
9.	.61	-.54	1.15
10.	.77	-.63	1.40
11.	-.38	-1.13	.75
12.	.69	-.42	1.11
13.	1.84	.16	1.68
14.	1.34	.73	.61
15.	.20	-.35	.55
16.	.03	-1.12	1.15
17.	.36	-.36	.72
18.	.85	-.12	.97
19.	.20	-.92	1.12
20.	1.02	-.15	1.17
21.	-.38	-.95	.57
22.	.85	-.22	1.07
23.	.44	-.52	.96
24.	-.38	-1.09	.71
25.	.61	-.48	1.09
26.	1.18	-.58	1.76
27.	1.51	-.57	2.08
28.	.61	.04	.57
29.	1.02	.45	.57
30.	.44	-.12	.56
31.	1.34	.01	1.33
32.	-.46	-1.53	1.07
33.	-.30	-1.50	1.20
34.	-.62	-1.12	.50
35.	.85	.23	.62
36.	.85	.06	.79
37.	1.87	.89	.98
38.	.77	.23	.54
39.	.28	-.84	1.12
40.	1.75	.44	1.31
41.	-.46	-1.92	1.46
42.	-.54	-1.07	.53

*Those whose achievement index drops .50 or more below ability index.

TABLE II

IDENTIFICATION OF OVERACHIEVERS*

Student	Ability Index SCAT -	Achievement Index Grades -	Deviation
1.	-.46	.73	1.19
2.	-.79	-.03	.76
3.	-.71	-.31	.50
4.	1.34	2.56	1.22
5.	1.02	1.69	.67
6.	-.21	1.12	1.33
7.	-1.44	-.87	.57
8.	-.71	.16	.87
9.	-1.93	-.06	.87
10.	-1.77	-1.00	.77
11.	-1.28	.16	1.44
12.	-.21	1.77	1.98
13.	-1.36	.17	1.53
14.	-1.93	-1.29	.64
15.	-2.26	-.57	1.69
16.	-.54	.58	1.12
17.	-.87	.04	.91
18.	.20	1.63	1.43
19.	-1.20	-.28	.92
20.	-1.85	-.64	1.21
21.	.52	1.18	.66
22.	-.13	.84	.97
23.	-.46	1.03	1.49
24.	-.95	.41	1.36
25.	-1.28	-.25	1.03
26.	1.43	2.35	.92
27.	-.05	1.20	1.25
28.	-1.36	.52	1.88
29.	-.05	2.22	2.27
30.	.11	1.17	1.06
31.	.11	.74	.63
32.	-.13	1.44	1.57
33.	.11	.74	.63
34.	-.21	.57	.78
35.	.61	1.45	.84
36.	-1.93	-1.18	.75

*Those whose achievement index rises .50 or more above ability index.

the same tables.

The standard scores for SCAT and for grades with their respective differences provide the basis for the identification of underachievers and overachievers, for the deviation of one score from the other can be regarded as a standard sigma distance measuring the extent to which achievement falls short or exceeds the level established by the index of ability. In other words, the normal achiever would be one whose standard score for grades would be approximately the same as his standard score for SCAT, but the underachiever's standard score for grades would fall considerably below that for SCAT and the overachiever's standard score for grades would rise considerably higher than that for SCAT.

Out of the 157 students in the research sample, forty-seven were found whose standard score for grades suffered a drop of .5 sigma distance or more below the level of his standard score for SCAT, and thirty-seven were found whose standard score for grades showed a rise of .5 sigma distance or more above the level of his standard score for SCAT. Accordingly, underachievers and overachievers were defined, for the purposes of this study, as those whose standard score for achievement deviated .5 sigma distance capacity, respectively. Since all the individuals so identified were not available for testing, the working number

of underachievers was reduced to forty-two, and the working number of overachievers was reduced to thirty-six.

It should be observed that this method of identifying underachievers and overachievers has a distinct advantage over some methods that have been employed. The review of related literature revealed that the two groups were often drawn from the top and bottom extremities of the research population, from a Dean's list and a probation list, or from drop-outs and returnees. Such methods, however, tend to confuse underachievement and overachievement with low achievement and high achievement or with low ability and high ability. The individual at the bottom of the class may very well be a high achiever if he happens to have very low ability, and the individual at the top of the class may be a low achiever if he happens to have superior capacity. Any investigation made on the basis of such identification would turn out to be a study of dull versus bright students instead of a real study of underachievement and overachievement. The definition and method of identification employed in this study, however, classifies each individual as underachiever or overachiever in reference to his own capacity. From Table I it can be seen, for example, that students 13, 37, and 40 made good grades, yet all three were serious underachievers in reference to their own capacity. Likewise, from Table II it can be seen that students 10, 14, and 36 made poor grades, but yet all three were overachievers in reference to their very

low academic ability. Accordingly, the classification is in terms of underachievement and overachievement, not to be confused with low and high ability, or low and high achievement.

It is of interest to compare the group tendencies of the underachievers and the overachievers in respect to SCAT scores and grade averages. The means and standard deviations of the two groups and also of the total research sample, including normals, are shown in Table III on the following page. The underachievers and the overachievers are indeed differentiated, for the differences between the means on both the ability index and the achievement index (SCAT and grades, respectively) are significant well beyond the .10 level of confidence. The difference between the standard deviations for SCAT is significant at the .10 level, but no significant difference appears between the standard deviations for grades.

It should be observed that the means of the two sets of scores differ in opposite directions. The underachievers' mean lies above the average for the SCAT scores, but the overachievers' mean lies above the average for the grade scores. This situation is in keeping with the concepts of underachievement and overachievement set forth in this study--high ability students falling low in achievement, and low ability students climbing to high achievement.

Scope of Investigation. The problem of academic underachievement appeared from the review of related lit-

TABLE III

COMPARISON OF UNDERACHIEVERS AND OVERACHIEVERS AS GROUPS

		SCAT		Grades	
	N	M	SD	M	SD
Research Sample	157	78.6	12.2	61.7	6.9
Underachievers	42	85.2)*	8.6)*	58.2)*	4.8
Overachievers	36	71.6)	10.7)	65.5)	6.7

*Difference exceeding .10 level of significance.

erature to have many facets, the subject being approached from a variety of angles and numerous specific problem areas being investigated. Apparently a number of factors might possibly be related to the problem--family background, socio-economic status, school background, physical health, personal adjustment, value structure, interest pattern, vocational outlook, social relations, work habits, attitudes, and so forth. To ferret out the relationship of all such factors would exceed the bounds of practicality for a single research project, so it has been deemed advisable to limit this investigation to certain personality traits and study habits and attitudes. Hence, it has been proposed that an analysis be made of the relation of those personality traits defined by the Edwards Personal Preference Schedule to academic achievement, and also of the relation of the various factors measured by the Brown-Holtzman Survey of Study Habits and Attitudes to academic achievement.

Such a limitation of the scope of investigation to the two particular areas of personality traits and study habits and attitudes seems advisable for reasons other than cutting the project down to feasible size. In the first place, the review of related literature has revealed that the findings of former research in these two areas, especially the area of personality traits, have not been in agreement. Furthermore it is felt that a better understanding of this phase of the problem of academic underachievement would be of most

benefit to the in-school academic guidance service with which this study is most concerned.

Guiding Hypotheses. In order that research endeavor might be directed toward specific objectives and definite conclusions, the following general hypotheses have been formulated:

1. That certain personality traits such as those defined by the EPPS serve to characterize underachievers and contribute to underachievement.

2. That certain other personality traits such as those defined by the EPPS serve to characterize overachievers and contribute to overachievement.

3. That a syndrome of study attitudes found in the SSHA would distinguish underachievers from overachievers and contribute to achievement deviation.

4. That a syndrome of study mechanics found in the SSHA would distinguish underachievers from overachievers and contribute to achievement deviation.

5. That certain of the personality traits defined by the EPPS correlate significantly, either positively or negatively, with academic achievement.

6. That a syndrome of study habits and attitudes correlate significantly, either positively or negatively, with academic achievement.

These general hypotheses were intended to give orien-

tation and direction to the proposed research activity. More specific hypotheses were projected for the testing of the significance of individual variables, but these will be discussed in connection with the analysis of results.

THE GATHERING OF DATA

After a preliminary survey of related literature, the selection of the research sample, and the identification of overachievers and underachievers, all of which was accomplished during the summer and fall of 1959, steps were taken to secure appropriate instruments which would yield the data necessary for the testing of proposed hypotheses. It was planned for such tests to be given during February of 1960, a time when the students concerned would be most accessible and most free to give the required time to the research project.

Selection of Tests. As has already been indicated, the Edwards Personal Preference Schedule was selected as the most suitable standardized instrument for the testing of personality variables related to academic underachievement. The sharp definition of the fifteen personality variables, the preference-response feature, and the avoidance of connotations of abnormal psychology were factors which led to the choice of the EPPS over such instruments as the MMPI or the CPI. These features were quite thoroughly

discussed in the review of related literature. Mention should also be made of the wide usage of the test in connection with underachievement studies, for such a situation makes possible a more profitable comparison of results.

The choice of the EPPS was warranted also by technical considerations. Both split-half and test-retest reliability coefficients are reported to run well into the seventies and eighties (EPPS manual, 1959, p. 19). The intercorrelations of the variables appear to be, in general, quite low, the largest being .46 between Affiliation and Nurturance, and the next largest being -.36 between Autonomy and Nurturance (EPPS, 1959, p. 20). The low values of the intercorrelations would indicate that the variables being measured by the EPPS are relatively independent. The validity of the test is less certain than its reliability because of the difficulty, as with all personality tests, of finding pure criteria by which to measure. Self-ratings and peer-ratings in various forms were tried, but the resulting correlations were not too consistent or very high. More encouraging evidence of validity appeared when the EPPS was checked against other instruments such as the Guilford-Martin Personnel Inventory and the Taylor Manifest Anxiety Scale. The resulting correlations were generally in the right direction and a number were significant beyond the .05 level of confidence (EPPS manual, 1959, pp. 21-22). Thus the validity of the EPPS may be regarded as comparable

to other standardized personality tests.

For the study of the relation of study habits and attitudes to academic achievement, the Brown-Holtzman Survey of Study Habits and Attitudes was chosen as the most suitable instrument. Other instruments, such as the Wrenn Study-habits Inventory, were considered, but these appeared to be more appropriate for counseling than for research. Their brevity would not permit a break-down into sub-factors or variables suitable for the analysis of the influence of study habits and attitudes upon academic achievement. The SSHA, on the other hand, seemed to be more appropriate for research purposes, in spite of the fact that the review of related studies did not reveal widespread usage of the SSHA in studies of underachievement. The authors strongly recommend the use of the instrument as a research tool as well as for screening and diagnosis (SSHA manual, 1956, p. 3).

The reliability of the SSHA is supported by evidence showing split-third reliability coefficients of .92 and .84 for men and women, respectively. Test-retest reliability coefficients with a two-week interval were .95 and .93, and for eleven-week intervals they were .88 and .84 (SSHA manual, 1956, pp. 6-7). The validity of the SSHA, as has been pointed out before, is supported by reports of correlations with grade-point averages amounting to .42 and .45 for men and women, respectively. Comparing these correlations between SSHA and grades with the reported correlations of .25 and

.34 between SSHA and ACE would indicate a much closer relationship of SSHA with achievement than with aptitude, thus making it suitable for use in the proposed investigation where the distinction between achievement and aptitude is important.

In the development of the SSHA, a total of 234 items was compiled from group interviews, from the reports of various studies in the field of learning, and from existing inventories on study habits and attitudes. By experimental testing and by statistical analysis, these items were reduced to a final selection of seventy-five to be used in the SSHA in its final form. For the most part, the items consist of two kinds: those dealing primarily with the mechanics and conditions of studying, and those concerned with attitudes toward studying and motivation to do well in academic work (SSHA manual, 1956, pp. 10-11). Since these categories are not distinguished in the test form or the scoring key, however, it was decided that the seventy-five items should be analyzed by inspection and grouped into several categories that might aid in the study of the relation of study habits and attitudes to academic underachievement. Accordingly, twenty items were selected which seemed to pertain to study mechanics, twenty which referred to study attitude, sixteen which had to do with the use of study time, and ten which expressed a sense of adequacy or self-confidence in regard to study. Supplementary scoring keys were then prepared which would check each of these groups of items and

weight the weak and strong responses in accordance with the regular SSHA system. Thus the general SSHA instrument was broken down to measure four separate variables in order to make possible a closer analysis of the relation of the various aspects of the study situation to academic underachievement.

Administration of Tests. In order to secure the most cooperative and most accurate response, effort was made to arrange a testing program which would be as convenient and least time consuming as possible for the students involved. Examination of the registration records indicated that all but about a dozen of the research sample were enrolled in four sections of the same class in education administration and taught by the same professor. Other second-year students, who were not in the research sample because they had not been in attendance the year before or because their records were incomplete, were in the same class and were given the tests along with the others without any distinction or identification of the research sample being made public. The remaining dozen members of the research sample were found to be enrolled in an education methods class, so they were tested there.

Arrangements were made with the administration and with the professors concerned to have one full period for the giving of the tests. At the beginning of each test session, the cooperation of the students was solicited by briefly

commenting on the importance of the research project and the value of their contribution to it. The directions for taking both the EPPS and the SSHA tests were then given according to the instructions set forth in the respective manuals. The EPPS was to be completed and turned in at the end of the test period, but the SSHA was to be completed outside of class and returned at the beginning of the next regular class session.

The response of the students to the testing program appeared to be very favorable. An atmosphere of interest and cooperation prevailed, and there was no evidence of insincerety or malingering. Most of the students were prompt in returning the SSHA tests which they had been directed to take at home, but it was interesting to observe that the few who were slow or needed urging to get their test forms back were for the most part from the underachiever list. Such an "activity-delay", it will be recalled, was found by Brown and his associates (1954) to be characteristic of underachievers at Texas University.

Both the EPPS and the SSHA sets of answer sheets were scored faithfully under careful supervision. In both cases, the hand-scoring keys were used and the scores were calculated according to the manual directions. Only in the case of the SSHA was exception made, where the supplementary keys for the special item groups described above were used.

CHAPTER V

ANALYSIS OF THE RESULTS OF THE STUDY

In order to determine the extent to which the test results would give support to the hypotheses set forth for the study, several forms of statistical analysis were carried out. Significant differences between the underachieving and overachieving groups were calculated to determine what variables were characteristic of either group and to what extent the groups differed in each respect. Correlation studies were then made to determine the extent to which the various variables were related to grades or academic achievement.

Significant Differences Between Underachievers and Overachievers. For each of the variables of the EPPS and of the SSHA a null hypothesis was set up stating that no difference existed between underachievers and overachievers in respect to that variable. The extent and significance of the difference between the means of the two sets of scores were then computed, and the .10 level of confidence was accepted as the boundary between significance and non-significance or the point of distinction between acceptance or rejection of the null hypothesis concerned.

The computation of the significance of the difference between the various means was performed by the "pooled"

method outlined by Garrett (1958, pp. 224-225). Accordingly, the standard deviation of the pooled scores, the standard error of the difference between the two means, and the t-ratios were computed by the following formulas:

$$SD = \sqrt{\frac{\Sigma(X_1-M_1)^2 + \Sigma(X_2-M_2)^2}{(N_1-1) + (N_2-1)}}$$

$$SE_d = SD\sqrt{\frac{N_1 + N_2}{N_1 N_2}}$$

$$t = \frac{M_1 - M_2}{SE_d}$$

The resulting t-ratio was then referred to Garrett's table (1958, p. 449) to determine the degree of significance for the seventy-six degrees of freedom, the combined number less one for each group. The results of these computations are tabulated in Table IV on the following page.

Of the personality variables defined by the EPPS, Dominance, Affiliation, and Change were found to exceed the .10 level of significance, the level necessary for the rejection of the null hypothesis. Dominance appears to be the personality variable which most clearly distinguishes between underachievers and overachievers, and the trait appears in favor of the underachievers. The emergence of Dominance as the most distinguishing characteristic of underachievers tends to increase the confusion in the evidence reported from related studies. Coleman (1960), it will be

TABLE IV

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS OF LOW ACHIEVER AND HIGH ACHIEVER SCORES ON EPPS AND SSHA VARIABLES

Variables	Low Achievers M	High Achievers M	Relationships SE_d	t
Achievement	13.58	14.36	.99	.79
Deference	13.33	12.81	.78	.67
Order	11.57	12.96	1.06	1.31
Exhibition	13.38	12.39	.76	1.30
Autonomy	12.36	11.72	1.03	.62
Affiliation	16.88	15.22	.86	1.93*
Intraception	16.21	17.31	1.16	.95
Succorance	11.79	11.58	1.20	.17
Dominance	13.00	10.66	1.09	2.15*
Abasement	16.66	17.39	1.15	.49
Nurturance	17.02	15.28	1.12	1.55
Change	15.00	17.19	1.17	1.87*
Endurance	13.95	15.55	1.01	1.58
Heterosexuality	13.50	13.55	1.34	.03
Aggression	10.26	11.50	1.03	1.20
Consistency	12.00	11.75	.43	.58
Mechanics	18.48	20.71	1.30	1.72*
Adequacy	9.86	8.44	.91	1.56
Attitude	18.07	20.61	1.58	1.61
Time	12.00	14.97	1.27	2.34*
SSHA %ile	38.40	43.90	5.97	.92

*Significance exceeding the .10 level of confidence

recalled, found the trait to be significantly lacking among his high achievers, but Reed (1959) and Morgan (1952) found it to bemore characteristic of high achievers than of low achievers. Krug (1959) on the other hand, found it to differentiate between high ability and low ability rather than between overachievement and underachievement. It is possible, then, that Dominance would not distinguish underachievers and overachievers as definitely if the ability factor were removed.

Although affiliation did not quite reach the required level for .05 significance, it came close enough to lend support to the claims of Reed (1959), Krug (1959), Burgess (1956), Owens (1949), and Strang (1954) that the need was more characteristic of the underachievers. It will be recalled, however, that Morgan (1952), Fair (1959) and Gowen (1960) submitted evidence to the contrary, so the role of Affiliation does not appear to be settled. Likewise, Change came close enough to the .05 level of significance to add weight to the claims of Fair (1959) and Field (1954) that high achievers are more "flexible" and "liberal". Here again, however, Coleman (1960), Reed (1959) and Burgess (1956) found Change to be more characteristic of the underachievers.

Five other personality variables--Order, Exhibition, Nurturance, Endurance, and Aggression--show sufficiently large t-ratios to suggest possible trends, but not to show certain differences. Order, Endurance, and Aggression tend

to favor the overachievers, and Exhibition and Nurturance incline in the direction of the underachievers. Finding Order tending to characterize overachievers is in line with the related studies as reported by Diener (1960), Krug (1959), and Gough (1953). Likewise, the tendency of Endurance to be in favor of the overachievers is in agreement with the findings reported by Reed (1959), Diener (1960), Krug (1959), Malloy (1955), and Gough (1953). The suggestion of a trend either one way or another for Aggression or Nurturance finds no support in related studies, and only Reed's findings (1959) agree that Exhibition might be characteristic of underachievers.

The t-ratios of the remaining personality variables as shown in Table IV are too low to suggest even a trend toward significance. In this, five of the variables--Intraception, Succorance, Abasement, Heterosexuality, and Consistency-- are in general agreement with the findings of related studies. It will be recalled, however, that the needs for Achievement, Deference, and Autonomy have often been found to have significance favoring the overachievers, contrary to the lack of evidence in the data of this study.

Of the four variables related to study--Mechanics Attitude, Adequacy, and Time--both Time and Mechanics show a t-ratio large enough for the rejection of the null hypothesis.

Attitude and Adequacy, however, are strong enough to suggest possible trends. All but Adequacy, it should be observed, are in favor of the overachievers. In spite of the weaker t-ratio for the composite SSHA percentile ranking score, the positive direction of these variables as a group is in keeping with the intended design of the SSHA to distinguish between high achievers and low achievers. Attitudes toward study, the mechanics of study, and especially the use of time are apparently important factors leading to high academic achievement.

In the analysis of the differences between the underachievers and the overachievers in respect to the EPPS personality factors and the SSHA study factors, the question arose concerning the possibility of a difference between the two groups in the degree to which they varied from their mean scores in the case of each of the variables. Consequently, null hypotheses were set forth for each variable stating that there was no real difference between the overachievers and underachievers in respect to standard deviation. To test these hypotheses, the significance of the difference between standard deviations was computed. For this the F-ratio was used according to the recommendation of Garrett (1958). The formulas employed were as follows:

$$V = \frac{\Sigma x^2}{N-1} \quad \text{and} \quad F = \frac{V_1}{V_s}$$

After each F-ratio was computed, Garrett's F table was con-

to ascertain the significance for thirty-five and forty-one degrees of freedom, or the reverse, as the case may be. It was necessary for the F-ratio to reach a value of 1.71 in order to be significant at the .10 level of confidence, thereby rejecting the null hypothesis and confirming a significant difference. The results of these computations are tabulated in Table V on the following page.

From Table V it is apparent that the overachievers and underachievers differ significantly in the extent of their deviation from their respective means only in the case of Consistency where the variance of the overachievers is considerably larger. Exhibition comes close to showing significantly greater variance in favor of the underachievers. Of the remaining variables, all of which show F-ratios too weak to be significant but strong enough to suggest possible trends, eight show the underachievers to incline in the direction of greater variance, and eleven suggest greater variance on the part of the overachievers. In general, it is apparent that overachievers and underachievers do not differ significantly in variance on the personality variables or the study factors.

Significant Correlations Between the Various Variables and Academic Achievement. In order to determine the extent of relationship between the various personality and study variables, grade averages, and SCAT scores, correlation coefficients were computed. For this, the entire research sample--

TABLE V

SIGNIFICANCE OF DIFFERENCE BETWEEN STANDARD DEVIATIONS OF LOW ACHIEVER AND HIGH ACHIEVER SCORES ON EPPS AND SSHA VARIABLES

Variables	Low Achievers V	High Achievers V	F-Ratio
Achievement	19.50	18.77	1.04
Deference	12.91	10.56	1.22
Order	25.84	17.59	1.47
Exhibition	13.58	8.24	1.65*
Autonomy	19.70	21.76	1.10
Affiliation	13.71	15.50	1.13
Intraception	24.69	28.16	1.14
Succorance	31.04	23.84	1.30
Dominance	24.98	20.58	1.21
Abasement	23.02	28.88	1.25
Nurturance	23.80	25.41	1.07
Change	28.15	24.51	1.15
Endurance	23.16	15.91	1.45
Heterosexuality	29.28	41.32	1.41
Aggression	18.52	23.11	1.25
Consistency	2.54	4.76	1.89*
Mechanics	30.59	35.59	1.16
Adequacy	15.05	17.28	1.15
Attitude	42.69	55.79	1.31
Time	32.49	30.08	1.08
SSHA %ile	681.75	702.63	1.03

*Significance exceeding the .10 level of confidence.

low achievers, high achievers, and the normal group in between--- was used. Table VI on the following page presents a matrix of all the intercorrelations found among SCAT scores, grades, EPPS variables, and SSHA factors. The correlations which reach or exceed the .05 level of confidence are underscored for easy reference.

Before proceeding to an analysis of the intercorrelations which bear specifically upon theproblem of academic underachievement, several observations from the matrix table should be made. The solid block of significant intercorrelations among the SSHA variables speaks well for the reliability of that instrument. SCAT's correlation of .48 with grades is in line with the correlations reported by other investigators for such instruments as SCAT, ACE, and SAT (pp. 36-37). The limited number of high intercorrelations among the EPPS variables, as compared with the solid block of high intercorrelations among the SSHA variables, provides evidence for the independency of the EPPS variables. By the same token, however, the independency of the SSHA variables would appear to be questionable. Interesting also are the highly significant and positive correlations of Endurance, Order, and Achievement with the SSHA variables. Apparently an element of conformity runs through the SSHA variables, however, indicated by the negative correlations with Autonomy and the positive correlations with Deference. Such conformity cannot be too extreme, however, in view of the positive correlation with Dominance

TABLE VI

INTERCORRELATIONS OF UNDERACHIEVEMENT VARIABLES

	Mec.	Adq.	Att.	Tim.	SHA.	Con.	Agg.	Het.	End.	Chg.	Nur.	Aba.	Dom.	Suc.	Int.	Aff.	Aut.	Exh.
SCAT	.05	.47	.08	-.05	.28	.01	-.06	.04	-.01	-.26	-.03	-.20	.20	.03	-.03	-.15	.12	.27
Grades	.16	.22	.23	.16	.31	-.07	-.03	.05	.09	-.20	-.09	-.05	-.07	.04	.11	-.23	-.03	.10
Deviation	-.08	.04	-.08	-.09	-.02	.06	-.04	-.05	.05	.04	.12	.05	-.11	-.12	-.03	-.00	.05	.21
Achievement	.12	.19	.14	.21	.19	.06	.14	-.02	.02	-.03	-.35	-.27	.17	-.22	-.09	-.38	.19	.07
Deference	.10	-.06	.18	.19	.09	-.08	-.21	-.25	.17	-.14	-.00	.10	-.05	-.13	.05	-.04	-.23	-.15
Order	.26	.01	.18	.31	.19	-.27	-.09	.00	.30	-.25	-.11	.06	-.17	.17	-.21	-.13	-.37	-.27
Exhibition	-.03	.17	-.10	-.13	-.01	.12	-.04	.01	-.41	-.03	-.12	-.20	.30	.02	-.00	-.12	.18	
Autonomy	-.23	-.06	-.24	-.24	-.21	.32	.14	-.04	-.15	.17	-.23	-.15	.18	-.27	-.14	-.27		
Affiliation	-.08	-.02	-.05	-.07	-.07	.02	-.37	-.16	-.13	-.15	.56	.19	-.25	.22	.09			
Intraception	-.00	.00	-.02	-.07	-.06	.08	-.28	-.37	.12	.03	.25	.07	-.14	-.27				
Succorance	-.03	-.03	-.11	-.06	-.04	-.21	-.09	.37	-.36	-.26	.16	-.04	-.33					
Dominance	.12	.20	.17	.05	.22	.12	.21	-.10	-.06	-.08	-.30	-.30						
Abasement	-.12	-.28	-.14	-.07	-.24	.06	-.25	-.21	-.00	-.12	.13							
Nurturance	-.17	-.14	-.14	-.11	-.19	.11	-.43	-.26	-.03	-.22								
Change	.01	-.06	.05	.04	.01	.11	-.05	-.04	.04									
Endurance	.39	.21	.41	.43	.34	-.13	.01	-.41										
Heterosexuality	-.15	-.01	-.18	-.27	-.06	-.21	.18											
Aggression	-.03	-.01	-.05	-.05	.06	-.07												
Consistency	-.02	.03	.02	-.00	-.01													
SSHA %ile	.69	.70	.87	.73														
Time	.68	.36	.80															
Attitude	.61	.50																
Adequacy	.48																	
Mechanics																		

Note: Underscored correlations exceed the .05 level of confidence.

.Aff.	.Aut.	.Exh.	.Ord.	.Def.	.Ach.	.Dev.	.Gra.	SCAT
-.15	.12	.27	-.09	.07	.23	.07	.48	
-.23	-.03	.10	.04	.03	.27	-.01		
-.00	.05	.21	-.03	-.00	-.14			
-.38	.19	.07	-.06	-.01				
-.04	-.23	-.15	.22					
-.13	-.37	-.27						
-.12	.18							
-.27								

and the negative correlation with Abasement.

In Table VII on the following page, the total matrix of intercorrelations is reduced to a listing of those between the various variables and grade averages and SCAT scores for the purpose of focusing upon the problem of low achievement and high achievement. The significance of results obviously differs from those gained from the computation of the significance of differences between the underachiever and the overachiever means. The same variables do not show significance in both cases. The Achievement variable, it will be observed, is very significant, considerably exceeding the .05 level of confidence and showing positive relationship between the need for Achievement and academic achievement as represented by grade average. The significance of the Affiliation variable is also high, but it differs from Achievement in that it shows a negative relationship with grade average. The significance of Change appears to be well above the .05 level of confidence, but the correlation is in the negative direction, indicating a closer relationship with low grades than with high high grades. As for the study variables it is interesting to observe that all four correlate significantly and positively with grade average, the level of significance in each case exceeding the 105 level of confidence.

TABLE VII

CORRELATION OF EPPS AND SSHA VARIABLES WITH APTITUDE SCORES AND GRADE AVERAGES

Variables	SCAT	Grades
Achievement	.236*	.267*
Deference	.069	.026
Order	-.093	.039
Exhibition	.274*	.098
Autonomy	.124	-.028
Affiliation	-.151	-.234*
Intraception	-.034	.113
Succorance	.034	.043
Dominance	.205*	-.072
Abasement	-.204*	-.051
Nurturance	-.027	-.094
Change	-.264*	-.204*
Endurance	-.007	-.095
Heterosexuality	.048	.051
Aggression	-.068	.035
Consistency	.011	-.067
Mechanics	.055	.159*
Adequacy	.470*	.220*
Attitude	.082	.229*
Time	-.055	.158*
SSHA %ile	.279*	.317*

*Significance exceeding the .05 level of confidence.

The general SSHA percentile scores, in turn, are found to correlate even more significantly with grades, far exceeding the .01 level of confidence.

According to the correlation test, then, the significant personality variables appear to be Achievement, Affiliation, and Change; but in the difference-between-means test, the significant personality variables appeared to be Affiliation, Dominance, and Change. Actually, the results are in agreement only in the case of Affiliation which appears in both cases to be in favor of the inferior group. Change, although appearing to be significant in both cases, is found to be in opposite directions--in favor of the overachievers according to the difference-between-means test, and in favor of the low achievers according to the correlation test. Achievement and Dominance, though not appearing to be significant in both cases, do show similar trends and in the same direction. The variables related to study--Mechanics, Adequacy, Attitude, and Time--also show similar trends in both tests, but stronger significance appears in the correlation table.

The question might be raised at this point as to why the difference-between-means test and the correlation test do not show the same pattern of significant relationships. It should be observed, in the first place, that the two populations are not entirely the same, for the difference-between-means test included only the underachievers and the overachievers,

whereas the correlations test added the normal achievers to the population group. This difference in the groups under investigation could account for some of the variation in the results. More important, however, is the recognition of the fact that the two tests do not really measure the same thing. The difference-between-means test measures differences between underachievers and overachievers as they are defined in relation to their respective abilities, but the correlations test measures the differences between low achievers and high achievers without reference to abilities. As indicated before, both underachievers and overachievers might make the same grade average, either high or low, their distinction depending only upon differences in abilities. Thus the differentiation resulting from the two tests would not necessarily be the same. This is a fine distinction, but an important one, and it helps to explain why many investigators have used the terms "underachiever" and "overachiever" for those who are differentiated with reference to ability, thus reserving the terms "low achiever" and "high Achiever" for differentiation without reference to ability. Accordingly, the results of this study would indicate that low achievers and high achievers are differentiated significantly by Achievement, Affiliation, Change, Mechanics, Adequacy, Attitude, and Time, and are so indicated by significant correlations. Underachievers and overachievers, on the other hand, are differentiated by Affiliation, Dominance, Change, Time, and Mechanics,

and are so indicated by significant differences between means.

In the light of these distinctions revealed by a comparison of the correlations and difference-between-means tests, a second look at the comparison between the results of this study and those of related studies should be taken. Bendig's correlation of .23 for Achievement (1958), with its higher number of degrees of freedom, would have about the same significance as the correlation of .267 found for Achievement in this study. Ward (1960), who distinguished between low-ability and high-ability achievers, found Achievement to be characteristic of both groups. The other related studies reviewed, however, did not make any distinction between low-ability and high ability achievers. Fair (1959), using the correlations test, found both Achievement and Affiliation, as defined by the California Personality Inventory, to be significantly related to grade-point average. Fair's significant and positive correlation with "flexibility", as defined by the CPI, however, is contrary to the significant but negative correlation found in this study for the EPPS variable of Change. Krug (1959), by making distinction between high-ability and low-ability students, found results in agreement with this study in regard to Dominance, for the trait significantly distinguished between high-ability and low-ability students, but not necessarily between high achievers and low achievers. Generally speaking, however, it is quite obvious that the reported investigations of the

problem of the relation of these personality variables to academic underachievement and overachievement have not distinguished low-ability from high-ability students among low achievers or high achievers. The comparison of the correlations test and the difference-between-means test involved in this study, however, suggests the importance of doing so.

The foregoing discussion of the implications of ability revealed by the comparison of the correlations test and the difference-between-means test is applicable to the study factors as well as to the personality variables. It has already been pointed out that the results of both tests reveal the same trends of relationship, but the correlations showed much stronger significance than did the differences between means, indicating that the SSHA differentiates more sharply between high achievement and low achievement without reference to ability than it does to underachievement or overachievement that is defined in reference to academic capacity. Such a conclusion regarding the influence of the ability factor, both in the case of personality and of study variables, is also supported by the evidence of the lack of consistency between the correlations of the variables with grades and the correlations of the same variables with SCAT as shown in Table VII.

Significance Revealed by Partial Correlation. In view of the fact that ability appears to be a rather strong

influential factor affecting the relationship between personality and study variables and grades, partial correlations were computed in an effort to remove or level out the influence of SCAT, the index of ability and the criterion upon which the identification of underachievers and overachievers for the difference-between-means test was made. Table VIII, on the following page, presents the partial correlations which were computed according to the pattern prescribed by Garrett (1958, pp. 407-408), the formula being as follows:

$$r_{12.3} = \frac{r_{12} - r_{13}r_{23}}{\sqrt{1-r^2_{13}}\sqrt{1-r^2_{23}}}$$

Although Table VIII shows the partial correlations as differing somewhat from the zero-order correlations, the general picture of the situation is changed very little. Affiliation and Achievement, with partial correlation of -.24 and .18, shift places in order of significance, the first rising to the .01 level of confidence and the later dropping toward the .05 level. Need for Achievement remains characteristic of the high achievers, and need for Affiliation remains more characteristic of the low achievers. Dominance, with a partial correlation of -.21, appears with significance raised to the .05 level in favor of low achievers, and Change holds its significance at the .05 level of confidence in favor of low achievers.

As for the variables related to study, some significance was lost and some was gained by the partial correlation, but

TABLE VIII

PARTIAL CORRELATIONS WITH SCAT REMOVED

Variables (1)	Grades (2) r_{12}	SCAT (3) r_{13}	$r_{12.3}$
Achievement	.27	.24	.18*
Deference	.03	.07	-.01
Order	.04	-.09	.10
Exhibition	.10	.27	.04
Autonomy	-.03	.12	-.10
Affiliation	-.23	-.15	-.24*
Intraception	.11	-.03	.16
Succorance	.04	.03	.03
Dominance	-.07	.21	-.21*
Abasement	-.05	-.20	-.05
Nurturance	-.09	-.03	-.08
Change	-.20	-.26	-.19*
Endurance	-.10	-.01	.11
Heterosexuality	.05	.05	.03
Aggression	.04	-.07	.08
Consistency	-.07	.01	-.14
Mechanics	.16	.06	.15
Adequacy	.22	.47	-.01
Attitude	.23	.08	.22*
Time	.16	-.06	.21*
SSHA %ile	.32	.28	.22*

*Significance exceeding the .05 level of confidence.

again the general picture remained similar to that which appeared in the zero-order correlation. Mechanics dropped from .16 to .15, and Attitude dropped from .23 to .22. Time, however, moved up from .16 to .22. Thus, Mechanics remained near the .05 level of significance, and Attitude and Time approached the .01 level. Adequacy showed a greater shift, dropping from .22 to -.01, thereby losing significance. The partial correlation of the total SSHA percentile with grade average dropped to .22, still significant at the .05 level.

What conclusions, then, can be drawn from these results? The similarity of the evidence gained by zero-order correlation to that gained by partial correlation would indicate that the weight of factors influencing achievement has not shifted much as a result of holding SCAT, the index of ability, constant. In other words, certain personality traits and study habits--Achievement, Affiliation, Change, Attitude, ane Time--remain significantly related to achievement after the influence of the ability factor has been removed or held constant. On the other hand, the shift in the correlation pattern resulting from partialing out SCAT is great enough to warrant the serious consideration of the ability factor in any study of academic achievement. Such procedure, for example, has raised the correlation of Dominance to significance, but dropped Mechanics and Adequacy from significance. Ability does influence the weight of other factors in their correlation with academic achievement.

In consideration of the statistical evidence as a whole, the respective roles of the three methods of analysis should be observed. Far from being identical, each of the statistical tests has a unique function and yields results of unique significance. The difference-between-means test took two groups divided on the basis of achievement relative to ability and found them to differ significantly in regard to certain personality traits and study habits. The correlations test took the research sample as a whole, disregarded the ability factor, and found certain personality traits and study habits to be significantly related to achievement. Finally, the partial correlations test held constant the influence of ability and revealed the resulting degree of correlation of the personality traits and study habits with academic acievement. Thus each test had its unique purpose and point of application, but taken together in complementary fashion they have revealed evidence of significant relations between personality factors and achievement, and also of the influence of the ability factor which is involved in underachievement and overachievement.

Verification of Hypotheses. The general hypotheses set forth in the orientation of this study appear to be verified and made definite as follows:

1. Certain personality traits such as the EPPS variables of Affiliation and Dominance serve to characterize underachievers and contribute to underachievement.

2. Certain other personality traits such as the EPPS variable of Achievement serve to characterize over-achievers and contribute to overachievement.

3. Study habits and a sense of adequacy as expressed in the SSHA tend to distinguish underachievers from over-achievers and contribute to achievement deviation.

4. Study mechanics and the use of time as expressed in the SSHA tend to distinguish underachievers from over-achievers and contribute to achievement deviation.

5. Of the personality traits defined by the EPPS, need for Achievement correlates significantly and positively with academic achievement, and the needs for Affiliation, Dominance, and Change correlate significantly and negatively with academic achievement.

6. Each of the SSHA syndromes--Attitudes, Mechanics, Adequacy, and Time--correlate significantly and positively with academic achievement.

In addition to the verification and sharper definition of these hypotheses, the results of this investigation have produced strong evidence that a distinction should be made between low achievement and high achievement on the one hand, and underachievement and overachievement on the other hand.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The extent and seriousness of the problem of academic underachievement hasbeen appraised, reports of research related to the problem have been reviewed, and the present study has been designed and carried out in the hope that a better understanding of the problem with its implications might be achieved. In the light of all the evidence, both from the related literature and from the results of this investigation, certain generalizations are in order.

The Problem. The extent of academic underachievement at the college or university level appears to be great enough to warrant sober concern and serious study. The reports of related literature that approximately one-third of the students in higher education should be regarded as underachievers has been confirmed by the present study, for out of a population of 157, forty-two were so classified. It cannot be denied that this represents a serious loss of effective and fruitful living for the individual underachievers concerned, a needless waste of time and energy on the part of the schools, and an unfortunate waste of human resources on the part of society.

Prediction Insufficient. Many worthwhile studies of

prediction have been carried out and efforts have been made to improve selection and to tighten matriculation screening. This investigation has shown, however, that the underachievers have not been removed from the scene of higher education. The evidence has revealed that many who are able to pass the matriculation examinations very successfully fail for some reason to sustain such a level of performance. Also, many who have achieved well in high school fail for some reason to carry on their good work in the university situation. It appears that prediction and screening practices must be supplemented by extensive and continued guidance for those who show underachievement tendencies after they launch upon their college or university program, and that the later effort might be even more important than the first.

Identification of Underachievement. The results of this study have indicated the need for sharp definition in the identification of underachievers. Too often no distinction is made between low and high achievement on the one hand and underachievement and overachievement on the other hand. It seems important that underachievement should be determined with reference to academic aptitude and with the recognition of low-ability and high-ability students in both low-achieving and high-achieving groups. Underachievers and overachievers have appeared in this study to comprise a distinctly different pair of categories than do low achievers

and high achievers.

Personality Factors Characteristic of Underachievement. The most obvious characteristic of underachievers as revealed by this study are their manifest needs for Dominance and Affiliation. Apparently the Dominance trait expresses an unwillingness to conform to the demands of the school situation, and the Affiliation trait likely reveals a greater interest and concern for social activity than for studies. The need for Change also appears to be characteristic of underachievers, although the evidence is not as strong as it is for Dominance and Affiliation. This evidence of the need for Change, plus slight indication of a weak trait of Endurance, suggests that underachievers lack the concentration and persistence necessary for academic success.

Personality Factors Characteristic of Overachievement. The only personality trait which has appeared to be significantly characteristic of the overachievers was the manifest need for Achievement. This would suggest that overachievers possess an extra measure of ambition and drive sufficient to carry them beyond the level of achievement that would normally be expected of them. The needs for Order and Endurance showed some tendency in favor of the overachievers, but not enough to be significant.

Personality Correlates of Academic Achievement. The

evidence of this study has shown the need for Achievement and the need for Affiliation to correlate very significantly with academic achievement, the first in a positive direction and the second in a negative direction. Thus, high achievers appear to be marked by a manifest need for Achievement, and low achievers by a manifest need for Affiliation. Although the relationship between these two personality traits and low and high achievement is similar to their relation to underachievement and overachievement, it should be remembered that an analysis of all the evidence does not warrant the identification of low achievers and high achievers with underachievers and overachievers. Whereas the need for Change was found to be characteristic of the underachievers, the same trait was also found to correlate significantly with high achievement.

The Importance of Study Factors. Study mechanics have appeared to be significantly related to academic success, but more significant than study mechanics are the attitudes related to the study situation and the use of time for study. Apparently a student with meager ability can reach fairly high levels of achievement if he happens to possess such study habits and attitudes. The present study gave strong support to this conclusion by showing significant differences between the means of underachievers and overachievers in respect to these variables, and by sustaining strong and

significant correlation between the variables and grades with the ability factor leveled out by partial correlation.

Adjustment and Motivation. The individual differences that were apparent in the data of this study suggest that adjustment and motivation are significant factors in the problem of academic underachievement, and that such differences may account for some of the inconsistency of results that has plagued the investigators. The student with a strong need for Affiliation may adjust to his problem by going all out for social life and thus becoming an academic underachiever, or he may endeavor to escape from his problem by burying himself in his books and thereby become an academic overachiever. Again, the need for Dominance might cause one individual to show his superiority by excelling as an overachiever, but it might lead another to resist the demands of the school situation to the extent that he would become an underachiever. Likewise with Change, the need might lead one individual to become a fickle underachiever, but it might cause another to become a flexible overachiever, readily adjusting to the demands of the school situation. In similar fashion, the individual differences in motivation, affected by aspiration level, vocational expectations, family ideals, prestige factors, and various other incentives, might lead one student to a level of achievement beyond his apparent level of ability, and another student to

a level of achievement considerably short of his apparent abilities. Thus it appears that both adjustment and motivation should be important considerations in the guidance program.

Recommendations for Further Research In view of the difficulty and confusion that investigators have encountered in their efforts to identify and measure personality traits which would characterize and differentiate underachievers and overachievers, it would seem that more "reverse" studies should be made where individuals possessing certain personality patterns would first be identified and then submitted in experimental fashion to achievement tasks. Such an approach should make possible a better control of related variables than has usually been the case.

It is also recommended that more studies be made where both low achievers and high achievers are separated into two sub-groups according to ability level. Such an arrangement should help to control the ability variable that apparently has caused confusion in previous studies.

It is further recommended that more effort be given to making sharper definitions of the variables related to study habits and attitudes. The single composite score yielded by the SSHA cannot be very meaningful in research, and the component variables employed in this study were defined and identified only by inspection. By contrast,

the EPPS variables were found to be more convenient to work with and to make possible a more penetrating analysis. Even the EPPS variables, however, appear to lack the precision common to most personality tests.

Finally, it is recommended that further investigations be made in the areas of adjustment and motivation. Both the present study and the review of related literature have indicated the importance of these areas and their relationship to the problem of academic underachievement, but few investigators have come to grips with the real issues at stake.

In conclusion, let it be repeated that if the results of this study can contribute to a better understanding of the factors related to academic underachievement so that guidance officers can aid in the fuller realization of the potential of human resources found among college and university youth, then the efforts involved have not been in vain.

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